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THE CLINICAL COURSE AND THE DIAGNOSIS OF TRACHOMA

M. H. FOSTER, A.M., M.D.
Surgeon, U. S. Public Health Service
BOSTON

Trachoma may be described as a specific, transmissible, destructive inflammation of the conjunctiva, characterized by the formation of the so-called trachoma granulations, which may be either papillary or follicular; the ultimate formation of scar tissue; marked chronicity, and intractability to all forms of local treatment.

Various inflammations of the conjunctiva give rise to the formation of follicles that cannot be distinguished by inspection from those caused by trachoma; hence the formation of scar tissue is the one all important diagnostic feature of the disease. If trachoma had been called "scar producing conjunctivitis" much of the confusion of ideas and differences of opinion that now exist concerning the diagnosis of the disorder would never have arisen.

Clinically trachoma presents itself in two forms: (1) fulminating trachoma, and (2) slow trachoma.

The first is a very acute inflammation which comes on suddenly and is accompanied by the usual symptoms of a severe infection of the conjunctiva, that is, redness, swelling, lacrimation, photophobia, pain and marked thickening of the lids. This type of the disease is rare, and will be described more fully later on.

"Slow trachoma" seems to be the best term to apply to the ordinary forms of the disease. At first blush it would appear that "chronic" would be the proper adjective to use. But the condition referred to under the second heading may be either acute or chronic; hence the name "slow trachoma" will be used in this article to refer to all forms of trachoma except the fulminating type.

Slow trachoma is essentially a chronic and long drawn out disease, generally extending over a number of years. It may begin acutely, or the onset may be so insidious that the patient is not aware that there is anything wrong with the eyes. In a short time the granulations appear. These may be considered under two general headings, the papillary and the follicular.

The papillary granulations are minute structures somewhat difficult to describe. They are closely packed together, and so small that the naked eye does not ordinarily recognize them as discrete bodies, but gets the impression that the areas involved are swollen, uneven and "raw" looking on the surface. An area of papillary granulations somewhat resembles in appearance the surface of the tip of the normal tongue.

The follicular granulations are more or less rounded bodies ranging in size from the head of a pin to a small pea, and presenting considerable variation in appearance and structure. Some stand well above the surface, with a more or less pedunculated base; others are buried in the conjunctiva. They may be bright red, pinkish gray, pinkish yellow, or almost white; the latter are deeply buried. The red are quite firm; the yellowish are generally soft and gelatinous, and may be translucent. The last are known as the "sago grain" or "frog spawn" granulations.

The largest follicles are found in the culdesac, and often bleed slightly when the lid is everted. The entire conjunctiva may be studded or infiltrated with these bodies, or only a few isolated ones observed.

In a varying time, depending on the severity of the case, scar tissue begins to appear as fine white lines or irregular areas between the granulations. The production of scar tissue goes on slowly, and ultimately replaces the normal conjunctiva on practically the entire surface of the upper lid and the culdesac.

Slow trachoma occurs in various grades of acuity. A small percentage of the cases are benign, running their course with slight discomfort to the patient. Others are severe, with much inflammatory reaction and marked symptoms. All possible gradations between these two extremes are seen in the clinics.

A striking characteristic of the disease is the tendency to alternating periods of quiescence and exacerbations of the inflammatory process. The diagnostic lesions are always present, however, and can easily be detected by a careful examination of the inverted upper lid and culdesac.

In the late stages, cicatrization becomes an important feature. If the tarsal plate is involved, the shrinkage and resulting deformities of this structure cause entropion. When this is marked, the eyelashes rub against the cornea, producing ulceration and opacity. In this manner sight is involved, and ultimately vision may be lost.

"Trachoma is a veritable curse to the countries where the disease is endemic, its victims suffer for years and are usually incapacitated for years; many of them become blind."[1]

METHOD OF EXAMINING THE EYE

Before attempting to diagnose trachoma, it is imperative that the observer should become thoroughly familiar with the appearance of the conjunctiva in both health and disease, and especially the conjunctiva of the upper lid and culdesac. To explore this part of the eye it is necessary to evert the lid and also to expose the culdesac by special manipulation. The best instrument for this purpose is the ordinary wire loop

1. Haab: External Diseases of the Eye.

glove buttoner obtainable in most clothing stores. The loop should be bent slightly so that it is curved on the flat, somewhat resembling in miniature the blade of an obstetric forceps. With practice it is possible to turn the lids very quickly and to bring down and examine various parts of the culdesac with but little discomfort to the patient, provided one has a reasonable degree of aptitude.

Fig. 1.—An old case of slow trachoma. This shows the proper method of using the glove buttoner as an eye turner in everting the upper lid and of exposing the culdesac. It is noted that about half of the culdesac is shown in this picture.

The eye turner is held in the right hand, and the lashes of the upper lid are caught between the thumb and the forefinger of the left. The patient's head is pushed well backward by extension at the neck, and at the same time he is told to look down (Fig. 1). The lid is easily everted over the wire loop, and the different parts of the culdesac brought into view by the proper manipulation of the point.

A normal lid when examined in this manner presents an appearance as shown in Fig. 2. The conjunctiva exposed is sharply separated into two divisions, the lower part—the culdesac—and that reflected over the tarsal plate. For brevity of description, this part of the conjunctiva will sometimes be referred to as the "tarsal plate," by which term is meant the conjunctival surface of the upper lid proper, and the other part as the culdesac.

The real relations of the lid as concerns direction are of course reversed when it is everted; but in all descriptions reference will be made to the everted lid, giving the relation of the structures as they appear when the lid is in this position. The appearance and distribution of the blood supply is an important feature in the diagnosis of trachoma, and will be described in detail.

The culdesac is normally bluish pink, and contains numerous blood vessels. The conjunctiva here is thin, so that in health the arteries stand out very distinctly like cords. These vessels (in the upturned lid) run upward toward the tarsal plate, and at the bottom of the plate they anastomose by horizontal branches which form pointed arches. From these arches numerous fine vessels arise which run directly upward over the tarsal plate. It is unusual to find such a regular and symmetrical distribution of the arteries as is shown in the illustration, which is however, a true copy of a selected eye; but this may be taken as the ideal type, and all normal eyes follow it more or less closely.

The conjunctiva over the tarsal plate in health is always redder and more granular than that of the culdesac, and in its lower part thicker and less transparent. In the upper part of the plate the meibomian glands can usually be seen under the conjunctiva as vertical yellowish lines likened to strings of very minute yellow beads.

By pressing the tip of the glove buttoner toward the examiner and putting the structures over it on the stretch, the conjunctiva can be made more or less anemic; and as this maneuver is extremely useful in diagnosing trachoma, it is very important that the physician become familiar with the appearance of the normal and the inflamed lids when subjected to this procedure.

When a normal lid is made tense by pressure with the point of the eye turner from below, the blood is forced out of the tissues and a white area appears. This spot is pure white or pink, and shades out evenly in all directions. If there are any irregularities of color present, they are faint vertical streaks running up and down, the meibomian glands. The same condition holds true of all simple inflammatory conditions of the lid. When they are pressed forward by the turner, the white area is even in color, and fades out uniformly in all directions. In trachoma, however, when the conjunctiva is made anemic in this way, it does so in a blotchy and uneven manner. The bloodless area does not fade out evenly to the pink and red of the unaltered tissue, but patches of red and white alternate in a more or less haphazard and irregular fashion. The white streaks run not only up and down, but transversely and in all directions. To get this effect it is necessary to use just the right amount of pressure, because if the force is too great the red areas will also disappear and the contrast will be lost. The pressure, therefore, is varied until we are satisfied that the conjunctiva presents a uniform appearance under all conditions of anemia. The explanation of this phenomenon is extremely simple. In health or in

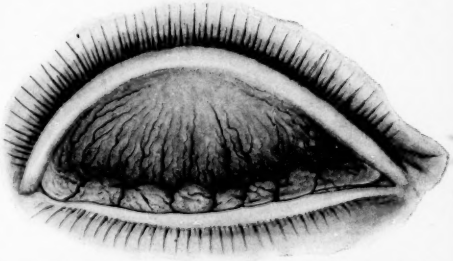

Fig. 2.—A normal eyelid. Note the lower one fifth, which is the culdesac. The conjunctiva in this region is thin and bluish pink, and the blood vessels stand out prominently like cords. The conjunctiva in the upper four fifths, covering the tarsal plate, is thicker, yellowish red, and supplied with blood vessels which run vertically upward across the plate from the anastomotic arches formed from the transverse branches of the arteries of the culdesac. The three small, whitish spots on the nasal side are areas of calcareous degeneration, and should not be mistaken for follicles.

the ordinary inflammations, the structure of the conjunctiva in any given area is practically uniform, that is, it is a homogeneous tissue; but in trachoma the structures are permanently changed. Scar tissue is formed, and it is deposited in irregular and more or

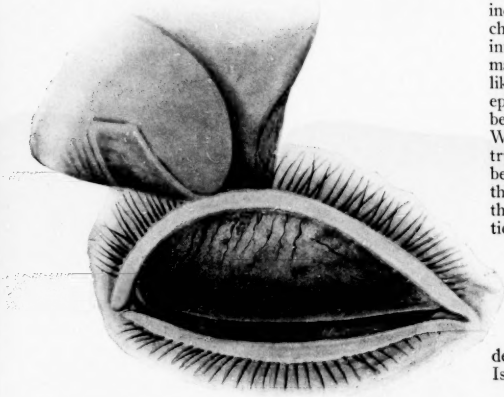

Fig. 3.—Upper lid of right eye. This illustration shows the appearance of a case of slow trachoma before proper pressure has been made with the eye turner. The lid is roughened and the adventitious blood vessels can be noticed running across the outer third of the tarsal plate. It is impossible, however, to make out any scar tissue when the lid is manipulated in this fashion. This should be contrasted with the same lid after the proper pressure has been applied, as shown in Figure 4.

less sharply defined patches. Between these patches are areas of highly vascular inflammatory tissue or normal conjunctiva (Figs. 3 and 4).

When pressure is made from beneath this ordinarily invisible scar tissue, it becomes white much more easily than the other elements of the conjunctiva; hence this maneuver enables us to detect it when it is present in very small amounts, that is, in the early stages of the disease. In well marked cases of long standing (Figs. 5 and 6), the scar tissue is at once apparent even to the most casual observer on simply everting the lid; but in recent or very mild cases, the scar tissue may be present in so slight an amount as not to be apparent unless the lid is manipulated as described above. The whole conjunctiva in such patients is more or less inflamed and swollen, and the small areas of scar tissue are deep down and obscured by the inflammatory changes (Fig. 3).

The lower lids are inspected by pulling them down with the index finger and having the patient look up, meantime moving the finger slightly from side to side to roll out all parts of the lower fornix.

It cannot be positively determined that any suspected individual is free from this disease until both lids of each eye have been carefully examined in the manner just described. Certain changes on the tarsal plate are always present in trachoma; but they may be so slight that only an expert can detect them, and the upper culdesac should invariably be examined by all ordinary observers.

The specific causative agent of trachoma has not as yet been discovered, although a tremendous amount of research work along this line has been carried out.

Prowazek has described certain cell inclusions that are frequently found in smears from trachomatous eyes that have been stained by Giemsa's method. Similar inclusions are found, however, in the pus from inclusion blennorrhea and sometimes in the genital discharges of men and women suffering from acute inflammation of these parts. Reference must also be made to Lindner's "initial bodies." These are coccilike bodies seen in the cavities of the protoplasm of the epithelial cells. They apparently multiply, and are believed by some investigators to be living organisms. Whatever the ultimate decision may be regarding the true nature of these cell inclusions, the subject may be dismissed for the present with the statement that the finding of these bodies is so inconstant as to render the making of smears and their microscopic examination of but little practical assistance in the clinical diagnosis.

Despite occasional assertions to the contrary, there is no doubt that trachoma is transmissible from one person to another. Fulminating trachoma spreads rapidly among the crowded occupants of a vessel's steerage, as has been amply demonstrated several times on vessels arriving at Ellis Island.

The virus of slow trachoma is not as virulent as the other variety, and some individuals undoubtedly possess a high degree of resistance to it. This explains the fact that several members of a family may escape although all the rest have the disease. Deliberate and accidental inoculations in human eyes have not always resulted in producing the disease. Cases are also occasionally encountered in which but one eye is involved.

The results of the attempts to inoculate apes and

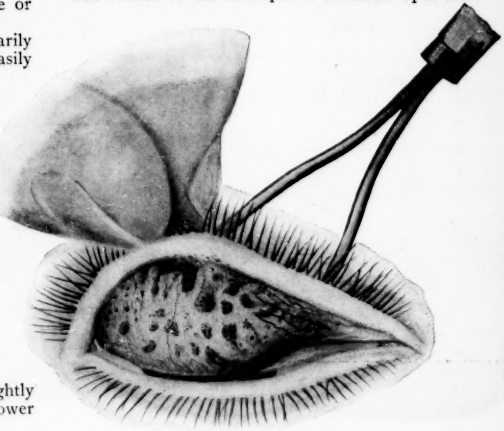

Fig. 4.—This is the same lid shown in Figure 3, but the glove buttoner has been manipulated so as to make the lid more or less anemic and bring out the scar tissue. Note the areas of papillary granulations surrounded by the bands of white scar tissue. This method of using the turner to make the lid anemic requires some practice, but is of extreme importance in detecting scar tissue in its early stages.

other animals with trachoma are inconclusive. Certain workers claim to have done so; but as the condi-

tion produced disappeared spontaneously in a few months without the formation of scar tissue, the identity of the disease produced in these animals with human trachoma has not been satisfactorily proved. The fact that inclusion bodies were found in the scrapings from the ape's eyes cannot be considered as confirmatory until the nature of these inclusions is definitely settled.

Surgeon C. H. Lavinder and I made numerous attempts to inoculate *Rhesus* monkeys and baboons with material obtained in cases of slow trachoma of the acute type. The experiments were carried on for several months, but the results were uniformly negative.

THE GRANULATIONS

Papillary Granulations.—The gross appearance of these granulations has already been described. According to MacCallan:

> The papillary growths are caused by an increase in the surface area of the hypertrophic conjunctiva. The latter is thrown into folds between which correspondingly deep clefts are formed; then on cross section the folds appear as papillary ridges. The connective tissue forming the papillae is covered with a very much thickened epithelium which of course is continued on into the depressions. These depressions have thus in microscopic cross section the appearance of narrow canals lined with epithelium and were accordingly regarded at one time as tubular glands; and hence the formation of new glands was alleged to occur in trachoma.
>
> Papillary hypertrophy as above described is not pathognomonic of trachoma; it is found in any condition of long continued irritation of the conjunctiva such as results from ectropion, spring catarrh and chronic conjunctivitis.

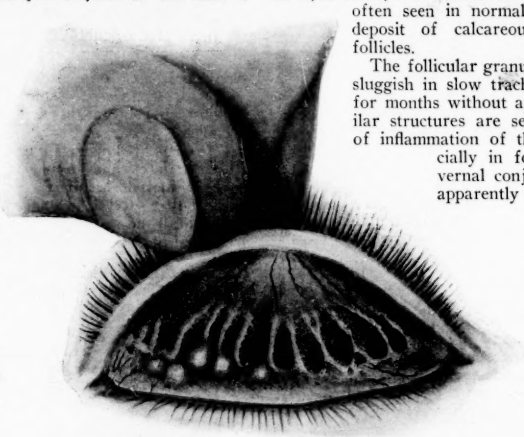

Fig. 5.—Upper lid of right eye. A typical case of slow trachoma of several years' standing. The islands of papillary granulations separated by vertical narrow lines of scar tissue are well marked. There are five large gelatinous follicles at the lower border of the tarsal plate. Note that the culdesac has been replaced almost entirely by scar tissue. The normal vertical vessels in the culdesac have disappeared, and a few adventitious vessels running in an oblique direction can be seen in the nasal side of the culdesac. There still remains some normal conjunctiva in the upper part of the lid.

Follicular Granulations.—These are the larger granulations ranging in size from a pinhead to a small pea. The largest ones are found in the culdesac. There are three quite distinct types, the red follicles which are the ordinary kind, the yellow gelatinous follicles, and the buried white follicles. All three varieties may be found in the same eye.

The firm red follicle is a very common lesion in all forms of trachoma (Fig. 9). These follicles may be simply poorly defined eminences in the conjunctiva, or well marked rounded bodies. The whole upper lid may be a mass of these new formations (Fig. 11), but it is more usual to find them along the lower border of the tarsal plate (Fig. 9).

The gelatinous granulations are grayish yellow bodies, soft in consistency, and frequently translucent. Large pedunculated gelatinous follicles are often found in the culdesac. They may bleed slightly when the lid is everted. These are the so-called "sago grain" or "frog spawn" granulations (Figs. 5 and 10).

Sometimes they fuse together, forming an area of intermingled gelatinous and scar tissue. This condition is known as Stellwag's brawny edema, or the gelatinous trachoma of Stellwag. It is especially common in the culdesac, the conjunctiva in this region being very much thickened, light bluish gray, and composed of fairly smooth scar tissue infiltrated with gelatinous material (Fig. 6).

The pure white follicle is found in the tarsal region, deeply buried in the conjunctiva, showing through as a small whitish spot or point (Fig. 9). Granulations of this description are not very common; when present they are generally found in the acute type of slow trachoma. As they are very rare in the ordinary inflammations of the conjunctiva, they may be rated as having some diagnostic importance. Care must be taken, however, not to mistake the small yellow bodies, often seen in normal eyes and due to a deposit of calcareous matter, for real follicles.

The follicular granulations are extremely sluggish in slow trachoma, and may exist for months without apparent change. Similar structures are seen in various forms of inflammation of the conjunctiva, especially in follicular catarrh, and vernal conjunctivitis. They are apparently not an essential lesion of the disease, but merely the reaction of the lymphoid elements of the conjunctiva to certain types of prolonged irritation.

The microscopic pathology of trachoma is in a somewhat chaotic state, considerable difference of opinion existing on many important points. It has been commonly taught that the follicles either ruptured and became organized, or became organized without rupture, and that in this way the scar tissue was produced. The objection to this view is the fact that the follicles produced by other forms of inflammation, especially follicular conjunctivitis, histologically resemble very closely the follicles in trachoma, and that these structures disappear without the formation of scar tissue, or at least without producing enough scar tissue to be detected clinically. The organization of the follicles either with or without rupture does not seem sufficient to explain the amount of cicatrization found in trachoma.

From a clinical standpoint there is good reason to believe that when the virus of trachoma attacks an eye, it ultimately invades the deeper structures of the conjunctiva and frequently in old cases the tarsal plate. The organism proliferates in these deeper structures, and gives rise to products that cause a rapid hyper-

plasia not only of the lymphoid elements but also of the connective tissue cells. The proliferation and organization of the fibrous elements of the conjunctiva produce the scar tissue which ultimately crowds out and entirely replaces the normal elements of the conjunctiva. The process of cicatrization, then, as pointed out by Fuchs,[2] is somewhat analogous to interstitial hepatitis, and *not* at all similar to the healing of an ulcer by scar tissue. As long as there is any lymphoid tissue left, the infection remains in it indefinitely. The virus does not exist in the scar tissue after the latter becomes fully organized.

Mayou asserts that by the use of certain plasma stains it is possible to distinguish histologically between many of the follicles of trachoma and those found in follicular conjunctivitis. He believes that:

> The granules found in trachoma are follicular formation plus trachomatous infection, the follicles being simply an effort on the part of the tissue to produce mononuclear cells, and becoming secondarily infected with trachoma. Although, indeed, as a general rule a considerable number of them seem to be infected even in the early states, . . . yet follicles can be found in trachomatous conjunctivitis which are evidently not infected with trachoma.

This view coincides closely with the clinical course of the disease, and is probably correct. The student should clearly understand that the follicular granulations are not an essential or diagnostic feature of trachoma, but should be considered as a complication. They do, however, afford a lurking place for the virus where it proliferates or may remain latent for months.

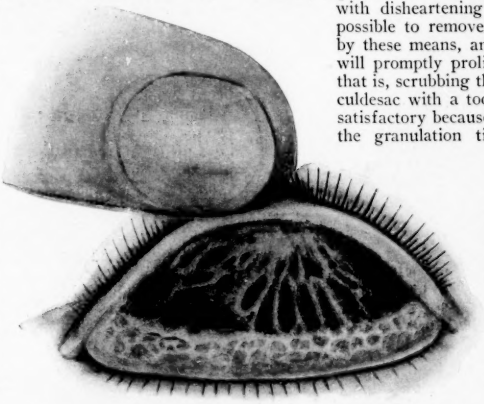

Fig. 6.—Upper lid of left eye. An old case of slow trachoma. Cicatrization is well marked. There remain, however, a few areas of papillary granulations near the center of the lid. The culdesac is completely filled up with a mass of poorly defined gelatinous granulations representing a typical case of Stellwag's brawny edema. The disease has existed for about six years.

In trachomatous eyes there is first the formation of ordinary follicles which are due to the irritation; and later on the virus invades these structures so that at first they are ordinary follicles and later on specific.

Rupture of the follicle may take place either from a thinning of the epithelium overlying it, owing to pressure from beneath, or from an interference with the blood supply by the scar tissue, causing necrosis.

The follicles are semisolid; hence, when rupture occurs, a part of the contents may escape, but not all. Septic infection of the ruptured follicle, however, is likely to occur, and the secondary inflammatory process ensuing may cause a temporary increase in size. Ultimately the follicle is destroyed by the combined action of the pyogenic organisms and the trachoma virus.

Undoubtedly some of the follicles, especially the smaller ones and those deeply buried in the conjunctiva, disappear by some process of absorption or atrophy.

2. Fuchs, H. E.: Text Book of Ophthalmology, Ed. 5.

Cases under treatment have been examined daily for a period of a year and a half without the rupture of any of the follicles being observed, and hence it will be apparent that the formation and rupture of the follicle is not a progressive pathologic process occurring in a more or less definite period of time.

It was formerly the custom to attempt to destroy these bodies by expression. In nontrachomatous cases, mechanical destruction of the follicles is followed by a disappearance of the condition in a comparatively short length of time. Some of the popularity of this method of treatment was probably due to cures produced in cases in which a mistake had been made in the diagnosis. Expression in true trachoma may hasten the disappearance of the larger follicular granulations, but it has no effect on the papillary granulations which are always present. A striking characteristic of trachomatous tissue is its ability to regenerate after partial destruction. The granulations may be curetted, excised, expressed or cauterized, and yet they return with disheartening persistence. It is impossible to remove all the lymphoid tissue by these means, and any trace that is left will promptly proliferate again. Grattage, that is, scrubbing the surface of the lid and culdesac with a tooth brush, is much more satisfactory because this operation removes the granulation tissue quite thoroughly; and the mercuric chlorid solution used on the brush is likely to sterilize what little remains. Grattage, however, cannot produce a cure when the tarsal plate is invaded by the trachomatous process, the infected tissue here being buried deep in the cartilage where the bristles of the brush cannot possibly reach it. Grattage followed some weeks afterward by removal of the tarsal plate is the procedure advocated by certain specialists for cases of this description.

The visible granulations in trachoma are generally limited to the under surfaces of the lids and culdesac, similar formations being very rarely seen on the bulbar conjunctiva. However, Mayou[3] determined that on section the bulbar conjunctiva does show changes, and at the corneal limbus certain inflammatory and degenerative areas may be noted. When properly stained and sectioned, on microscopic examination these areas are found to contain typical trachomatous follicles. Occasionally small pits or sunken scars may be observed just outside the limbus due to the cicatrization of these areas.[4]

SCAR TISSUE

In severe cases the scar tissue begins in the culdesac and spreads most rapidly in that region. In mild cases it may first of all be detected in the inner canthus at

3. Mayeu, H. S.: The Chaages Produced by Inflammation in the Conjunctiva, Hunterian Lecture, 1906.
4. MacCallan, A. F.: Trachoma and Its Complications in Egypt, Cambridge, 1913.

the junction of the tarsal plate with the culdesac, and careful search should always be made in this locality in doubtful cases. On the tarsal plate it generally extends upward in narrow bands toward the edge of the lid, with islands of exuberant lymphoid tissue in between (Fig. 5). A large stellate area in the middle of the tarsus is not unusual.

In the majority of patients the extreme outer and inner borders of the plate are the last to become cicatrized. The culdesac always becomes completely

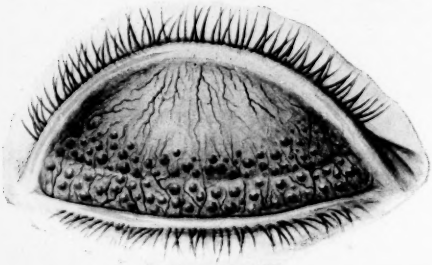

Fig. 7.—Follicular conjunctivitis, upper lid of right eye. The culdesac and the lower portion of the tarsal plate are studded with a large number of follicles. These follicles are fairly uniform in size, almost perfect hemispheres, and they appear to spring from the surface of the conjunctiva and are not buried in that structure. This form of follicular conjunctivitis is not so common as that shown in Figure 8. The diagnosis from trachoma in cases of this type is made by the fact that the conjunctiva is not thickened, that the normal blood supply is maintained, the vessels of which can plainly be seen running vertically upward in the culdesac; also by the size, appearance and superficial position of the follicles. It should be observed that there is no thickening in the conjunctiva of the culdesac, that structure being normal in the spaces between the granulations.

converted into scar tissue long before the process is completed on the upper lid. When completely organized, the scar tissue is pure white, smooth, and somewhat glistening. Usually it forms in islands which slowly spread; but very rarely the formation takes place simultaneously and at a uniform rate over the entire tarsal conjunctiva. In mild cases the process goes on very slowly, and it may be years before the lids are completely cicatrized.

Patients are occasionally encountered with a narrow band of scar tissue running horizontally across the culdesac. The strip is so even in width and sharply demarked as to appear as if made by a surgical operation. The tarsal conjunctiva is somewhat thickened, but not characteristic of trachoma. MacCallan[4] believes that scars of this description are produced by a former attack of gonorrheal conjunctivitis, and this opinion is probably correct.

The lower lids for some reason recover much more promptly than the upper, and it is not always easy to decide whether scar tissue is present. For this reason an examination of the lower lid alone often affords but little information in slow trachoma. Many well marked and severe cases will be found in which the lower lids present absolutely no pathologic changes to the naked eye.

In fulminating trachoma, however, the lower lid is diagnostic in the early stages.

PANNUS

In all cases of trachoma, pannus is generally present. This statement is not to be construed as meaning that a leash of large blood vessels will be found running across the cornea; but that on close inspection, with a hand lens if necessary, a fringe of very fine, almost invisible vessels invading the cornea from the conjunctiva can be detected. They are generally most marked in the upper and lower segments, but may extend completely around the corneal limbus. A more or less opaque gelatinous membrane is apt to follow the vessels onto the cornea.

Pannus is now considered as trachoma of the cornea and to be due to an invasion of that structure by the specific inflammation.

A temporary invasion of the cornea by fine vessels as described above may be encountered in a number of acute inflammations of both the cornea and the conjunctiva. According to MacCallan,[4] the permanent pannus of trachoma may be distinguished from that due to ulcers of the cornea and a secondary variety produced by interstitial keratitis, by the following points: When due to an ulcer, the vessels are larger and are localized to one part of the cornea. The pannus produced by interstitial keratitis arises from the deeper blood vessels of the sclera, and the vessels seen on the cornea cannot be followed up and proved to be continuous with those of the conjunctiva; while in trachoma it can be determined that the fine vessels seen on the cornea are branches from the conjunctival blood supply.

Pannus of a moderate degree frequently clears up, leaving but slight evidence. When present it is merely an evidence of irritation of the cornea and the response of that tissue to inflammation, and should be considered as a corroborative and not a positive sign of trachoma.

CORNEA

In old neglected cases or those that have been very severe, it is common to find corneal opacities with extensive pannus. Many such eyes are seen among the Egyptians, Syrians, Indians and some of the mountaineers of our own country.

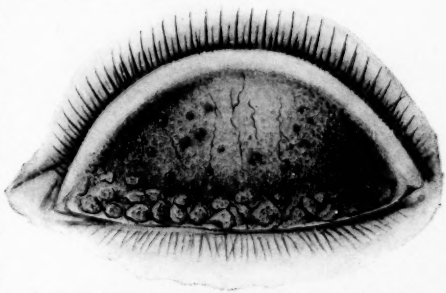

Fig. 8.—Typical case of follicular conjunctivitis, upper lid of left eye. In this patient the culdesac is filled up with a number of irregularly shaped, light colored follicles. The conjunctiva over the tarsal plate is somewhat roughened and thickened, and contains a few scattered small lymphoid follicles. Here there is a hypertrophy of the lymphoid elements of the conjunctiva with chronic conjunctivitis. The diagnosis between cases of this type and trachoma is sometimes extremely difficult. Lids of this description are very frequently found in schoolchildren, and often cause the examiner much embarrassment in making a diagnosis. Careful observation will show, however, that the normal blood vessels can still be seen here and there in the culdesac; also, that there are areas of more or less normal conjunctiva between the large follicles in that region. In such cases no scar tissue can be detected; neither is there any true trachoma pannus. The examination of the throat and nose in these patients will almost always show that there is hypertrophy of the adenoid tissue in these localities, such as enlarged tonsils or adenoids.

Ulceration of the cornea in trachoma results from two causes:

1. The trachomatous inflammation attacks the tissue of the cornea itself, or some other form of infection gains lodgment in a trachomatous eye, causing the ulcer by the usual pathologic changes.

2. The contraction of the eyelid, especially the deformity of the tarsal plate, produces trichiasis, and the inverted lashes rub on and irritate the cornea. The last seems to be the commonest cause of opacity of the cornea.

The older teaching, that the roughness of the upper lid due to the follicles was responsible for the damaged cornea, cannot be true. Hundreds of cases with eyelids fairly studded with follicles are seen in which the cornea is clear and uninjured; hence some other cause for the corneal lesions must be sought.

The invasion of the cornea by the disease itself and the trichiasis are the more likely causes. Some weight must also be given to the interference with the circulation of this structure due to the constant pressure of a deformed lid.

DEFORMITIES OF THE LIDS

Some degree of ptosis is present in almost all cases of slow trachoma of long standing, and it is especially marked in the fulminating type of the disease, the lids being greatly swollen.

In old cases the shrinkage of the scar tissue produces various deformities, and the lower edge of the lid is apt to present a wavy line instead of the normal curve with the convexity downward (Fig. 12). Such eyes have a "droopy" look, very significant to the trained observer.

In severe cases the inflammatory process does not stop at the conjunctiva, but also invades the tarsal cartilages where no ordinary applications can reach it. Scar tissue is produced here as elsewhere, and the plate may be twisted and pulled entirely out of shape by the resulting cicatrization. Entropion with trichiasis, as mentioned above, is the usual result and the most serious. In slow trachoma the disease may exist for many years before these changes become evident, and in some mild cases they never appear at all.

The conditions which have just been described are the usual lesions of trachoma. Among the rarer sequelae of severe cases of the disease should be mentioned exerosis conjunctivae, posterior symblepharon and ectropion of the lower lid.

DISCHARGE

In all trachoma there is more or less secretion; but the disease is so often complicated with other conjunctivitis that the nature of the discharge is of little importance and of no help in making the diagnosis.

CLASSIFICATION OF TRACHOMA

Various classifications based on clinical characteristics have been proposed by the different writers on trachoma. Some of them are rather complicated, and none altogether satisfactory. A common plan has been to describe the papillary, follicular and mixed forms, according to the type of granulations which predominated. As papillary granulations are always present as long as the trachoma is active, there can be no such condition as a simple "follicular" form in contradistinction to a "mixed" type, and either the "follicular" or the "mixed" subdivision should be omitted, for the terms in this instance are synonymous.

If some clinical classification of slow trachoma is desired to secure brevity of description, the term "papillary" might be properly applied to those cases of trachoma in which no follicles can be detected by the naked eye, and "follicular" to those in which, in addition to the papillary granulations, definite follicles are present. It must be clearly understood, however, that this is a clinical classification only; because if the papillary cases are examined microscopically, true trachoma follicles will be found in the conjunctiva, but they are too small or too deeply buried to be seen on inspection.

The gelatinous trachoma of Stellwag has already been mentioned. In it there is a fusing together and gelatinous infiltration of the follicles which is more commonly found in the culdesac.

STAGES OF TRACHOMA

When the formation of scar tissue has advanced sufficiently so that it is easily observed in the conjunctiva, the eye is described as being in the beginning stage of cicatrization.

As the process proceeds and the areas of scar tissue

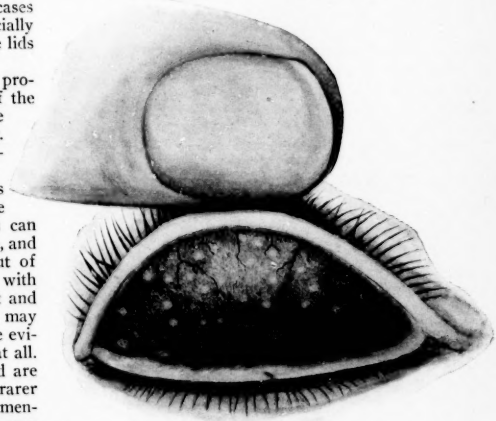

Fig. 9.—Recent case of slow trachoma, upper lid of right eye. The lower part of the culdesac of this eye is completely converted into scar tissue. On the lower part of the tarsal plate there is an area of poorly defined, deep red, partially buried granulations. Higher up still are a number of deeply buried small white granulations. Careful examination with the eye turner showed beginning scar tissue between the granulations over the tarsal plate. The deep buried white granulations are strongly significant of trachoma. Note the thickening of the culdesac and the absence of any visible blood vessels in that locality. This case should be studied in conjunction with Figure 8. The diagnosis of trachoma is made on the scar tissue and deeply buried white granulations, and the absence of the normal blood supply. There was also marked pannus in this case.

equal or exceed the other parts, the case is referred to as being in the advanced stage of cicatrization.

"Cicatricial lids" is the term applied to the eyes when the trachomatous tissue has been completely replaced by firm, smooth, white scar tissue. This is nature's only method of effecting a cure.

RELATION TO SURROUNDINGS, RACE AND AGE

Trachoma flourishes chiefly among the overcrowded, underfed, overworked, and those living in bad hygienic surroundings generally. No locality or race is exempt, however, and occasionally cases are found among the well-to-do and those whose method of life is above reproach from a sanitary standpoint. The age inci-

dence is extensive. I have seen a well marked case in a child under 2, and I have a patient under treatment now who contracted the disease after 63.

FULMINATING TRACHOMA

Fulminating trachoma is an acute and severe inflammation of the conjunctiva. The onset is abrupt, the upper and lower lids becoming affected practically simultaneously.

The palpebral conjunctiva is intensely red, very edematous, and much thickened. It has not the velvety appearance of a severe case of acute conjunctivitis, but is more coarsely granular; and while it may not present typical discrete follicles, its surface is markedly irregular and uneven like a piece of broken granite (Fig. 11). The ocular conjunctiva is always more or less involved, sometimes very severely; but it does not usually present any diagnostic symptoms other than those of a very intense reaction. The conjunctiva of the lower lid presents the same appearance of broken granite and appears to be superabundant, being thrown up into folds or ridges. Discrete and definite follicles may also be present in this locality.

While the lids are always very much thickened from the start in this type of the disease, the time for the appearance of the characteristic unevenness or follicles varies considerably. It may be delayed for seven or eight days, generally, however, appearing early or about the fourth day.

There is photophobia, blepharospasm, and a profuse watery discharge sometimes mucopurulent. The cornea often becomes involved either from an interference of its blood supply by the edematous and inflamed ocular conjunctiva, or by being attacked directly by the infection itself. Ulceration and infiltration may follow with widespread destruction to the corneal substance and subsequent opacities.

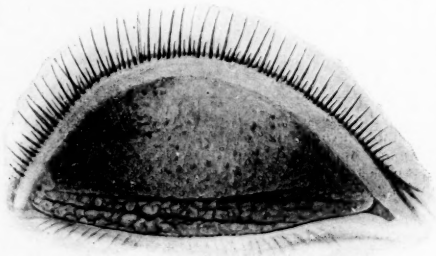

Fig. 10.—Slow trachoma of some months' standing, upper lid of right eye. The culdesac here is filled with a mass of poorly defined, semigelatinous granulations of a pinkish salmon color. Deep cracks can be observed between the granulations which are arranged more or less roughly in rows. The conjunctiva of the tarsal plate is much thickened, very rough, and shows numerous small granulations which can be best detected at the nasal and temporal extremities. No blood vessels are visible anywhere in the eye. No scar tissue could be detected by the most careful search. It is difficult to make a positive diagnosis of trachoma in eyes of this type at the first examination, although the appearance is strongly suggestive of that disease. Patients presenting this appearance should be given treatment for several weeks before a definite and positive opinion is given as to the nature of the disease.

Fulminating trachoma is much more easily transmitted from one person to another than slow trachoma. Generally both eyes are affected, but in rare instances only one eye is involved. The period of incubation has not been definitely determined, but appears to be within eight days.

Fulminating trachoma is a rare disease; in fact, its existence has been denied by some authorities; but on a number of occasions, cases of this type of the disorder have appeared among the crowded occupants of the same steerage compartment of vessels arriving at Ellis Island.

Differential Diagnosis.—Fulminating trachoma must be diagnosed in the early stages from severe phlyctenular conjunctivitis and from acute infections of that membrane by various micro-organisms, especially the gonococcus and the diplobacillus of Morax-Axenfeld. Unless one of these specific organisms is demonstrable in a properly stained smear made from the discharge, the diagnosis may be impossible for a few days. As soon, however, as the characteristic lymphoid enlargement has appeared, the true nature of the disease may be determined. The upper lids in severe simple conjunctivitis and phlyctenular conjunctivitis may present a roughened granular appearance which is apt to be confusing; but in these conditions the lower lids never present the same exuberance of the conjunctiva with the lymphoid follicles so well marked or so prominent as they are in fulminating trachoma. The characteristic phlyctenules in phlyctenular conjunctivitis will also assist in separating that disease. It must also be remembered that there may be an attack of phlyctenular conjunctivitis in an eye already infected with trachoma or a severe attack of acute conjunctivitis in conjunction with follicular catarrh, in which case the diagnosis is practically impossible until the acute complication has subsided. The shortest period in which scar tissue has been demonstrable in these cases by me was six weeks after the beginning of the attack. This, however, is probably unusual, scar tissue not appearing in the ordinary case of the fulminating type until several months have elapsed.

In fulminating trachoma the ocular conjunctiva is always intensely inflamed. This symptom is of material assistance in separating the disease from slow trachoma which is undergoing an acute exacerbation.

COMPLICATIONS OF TRACHOMA

An eye that is already the seat of a trachomatous inflammation may have added thereto any of the other infections to which the conjunctiva and cornea are liable. These conditions are known as "complicated trachoma," and are quite common. The trachomatous process does not protect the eye, as far as is known, from any other kind of inflammation; but, on the other hand, it appears to predispose it to certain forms. A gonorrheal infection is very common with trachoma among the Egyptians, and spring catarrh is frequently complicated by trachoma in localities on which both diseases are common.

The addition of any other infection to a trachomatous eye causes a swelling, redness and discharge which may make the diagnosis for the time being extremely difficult or impossible. Most of these complications, however, can be subdued or overcome by appropriate treatment, maintained for a sufficient length of time, and then the true condition can be definitely determined. The clinical appearance of complicated trachoma, therefore, is that of the original disease plus the symptoms of the added infection. The rule in all such cases is appropriate treatment until the complication has subsided.

DIFFERENTIAL DIAGNOSIS OF SLOW TRACHOMA

The important diagnostic symptoms of trachoma are scar tissue, papillary granulations and trachoma fol-

licles. The most important of these is the scar tissue. It may not be present in the early stage, but sooner or later it is bound to appear. The method of searching for and demonstrating the presence of scar tissue has already been fully explained. It must be remembered in this connection, however, that scars are formed in the conjunctiva by burns from lime or other escharotics, and also by certain infections that cause sufficient inflammatory reaction to produce sloughing or ulceration of that membrane. The narrow strip running horizontally across the culdesac caused by gonorrhea has already been described. Considerable scarring also is the result occasionally of severe cases of smallpox. The scars formed by burns or ulcers, however, differ materially in appearance from those of trachoma, as they are sharply demarked and the conjunctiva is not infiltrated in the irregular manner that is found in that disease.

FOLLICULAR CONJUNCTIVITIS

There are two types of follicular conjunctivitis. The variety illustrated in Figure 7 is unusual. This form may be described as a true folliculosis without an accompanying conjunctivitis. The follicles are small, in color match that part of the conjunctiva in which they are found, glassy in appearance, very uniform in size, sharply demarked from the surrounding tissues, and appear to spring from the surface of the conjunctiva rather than to be embedded in that structure. In these cases the conjunctiva is not inflamed or thickened, but maintains its normal appearance between the follicles; and, what is of the utmost importance, the blood vessels show the same arrangement and stand out as clearly as they do in the normal eye.

Fig. 11.—Fulminating trachoma of several months' standing. The upper lid is everted and fastened in position on the rubber eye plate by means of two sutures. The patient is under ether preparatory to the grattage operation. A good part of the culdesac can be seen, especially in the nasal half of the eye. Note the numerous granulations, which have been described under the section on fulminating trachoma as having a characteristic appearance something similar to broken granite.

The other type of follicular conjunctivitis is that shown in Figure 8. Here there are numerous follicles in addition to a low grade chronic conjunctivitis. The follicles are irregular in shape and size. The largest are found chiefly in the culdesac or on the lower border of the tarsal plate. They are not so sharply demarked as in the preceding type, and there is more or less thickening and roughening of the conjunctiva between the follicles, although not nearly so much as is found in a true trachoma. The blood supply, while somewhat obscured by the slight inflammatory reaction present, is nevertheless normal, and can be made out on proper examination.

It is this form of follicular conjunctivitis that has caused the greatest confusion in the diagnosis of trachoma, especially among schoolchildren. The process appears to be merely a part of a general hyperplasia of the lymphoid tissue throughout the entire body, for in such cases there are often found adenoids and enlarged tonsils; and the period of life in which this disease occurs corresponds to that in which there seems to be a marked tendency for all the lymphoid tissue to proliferate on slight stimulation. The local irritation in this instance may be due to dust, foul air, gases, and even possibly eye strain.

When the characteristic scar tissue can be made out by the proper manipulation of the eye turner, it is easy to rule out follicular conjunctivitis. In recent cases the diagnosis must be made on two things: (1) the condition of the conjunctiva of the culdesac and lower one third of the tarsal plate (everted lid), and (2) the blood supply of the culdesac.

In the early stages of trachoma, the fornical conjunctiva of the upper lid is always more swollen, inflamed and rough than in follicular conjunctivitis, and no areas of normal tissue can be seen in this region or over the lower third of the tarsal plate.

No visible blood vessels can be detected in the culdesac in the beginning stages of trachoma, as the inflammatory changes obscure them. In follicular conjunctivitis the vessels may be almost hidden or considerably distorted by the follicles; but if any vessels are observed running in a *vertical or approximately vertical direction* across the culdesac, it is safe to exclude trachoma (Fig. 8).

Occasionally it may be necessary to treat the eyes for a few days with sedative and slightly astringent remedies in order to overcome a temporary inflammation before giving a positive opinion as to the nature of the case.

VERNAL CATARRH AND OTHER DISEASES

In this disease the conjunctiva of the tarsus is the seat of a number of papillae which are broader and flatter than those in trachoma. The new growths are crowded closely together, resembling somewhat a cobblestone pavement, and are frequently covered by a bluish white film. In addition to the palpebral lesions, there also may be new formations around the limbus of the cornea in the shape of uneven, hard, gelatinous masses. The symptoms of vernal catarrh are much worse in the spring and summer than in the winter, and the history of the case often will assist in the diagnosis. The characteristic lesions are present throughout the year, but the signs of acute inflammation, that is, the redness, photophobia and lacrimation, are much ameliorated during the winter.

Some cases show involvement only of the tarsal plate, with no symptoms around the limbus of the cornea. In others the cornea is the only part affected. The secretion is generally scant, but when properly stained shows a large number of eosinophil cells.

The diagnosis from trachoma is made on the history; the appearance of the granulations, which are larger, flatter, paler and more closely packed together than in trachoma; the bluish white membrane when present, and the large number of eosinophil cells found in the discharge.

The commoner inflammatory conditions of the conjunctiva likely to be mistaken for trachoma have been described in detail. Other diseases that present clinically somewhat similar lesions to trachoma and may on rare occasions have to be diagnosed from that disorder are tuberculosis of the conjunctiva, syphilis of the conjunctiva, nodules around foreign bodies and Parinaud's conjunctivitis.

Tuberculosis of the conjunctiva appears as small grayish nodules on the tarsal surface with occasional ulcers. There is apt to be swelling of the glands in front of the ear. The bacillus may be found in sections of the involved tissue or by inoculation of the material into guinea-pigs. As a general thing, the disease attacks but one eye, and is not very painful.

Parinaud's conjunctivitis is a rare disease involving in most instances but one eye. It is characterized by the formation of follicles and sometimes ulcers in the conjunctiva. A marked feature is the systemic condition, the patient at the onset having fever, chills and enlargement of the preauricular gland, which frequently goes on to abscess formation. The entire parotid region may be swollen and tender. Sometimes the retromaxillary and cervical glands are also involved. In addition to the follicles, the eyelids are swollen and hard, and the culdesac is often very red and edematous. The chills, fever and involvement of the glands differentiate this form of conjunctivitis from trachoma.

WHEN IS TRACHOMA CURED?

On this point there is a great diversity of opinion. Patients attending clinics are often discharged as cured when acute inflammatory symptoms have subsided and there is no discharge. Such cases, however, almost invariably relapse sooner or later, and the mere cessation of secretion and the acute subjective symptoms should not be taken as proof of recovery from the disease. When an eye has become infected with the trachoma virus, it is liable to a recurrence as long as any normal conjunctiva, or any lymphoid tissue in the conjunctiva remains. The infection lingers in the granulations apparently indefinitely, and some trifling local irritation or constitutional disorder may cause it to spring into renewed activity at any time, and thus produce an acute exacerbation of the disease.

A case can never be said to be certainly cured until all the conjunctiva of the upper lids has become completely replaced by smooth, white, avascular, fibrous scar tissue, and the lower lids are free from any evidences of the disease. A vascular scar tissue cannot be infected by the virus of trachoma. In treating trachoma with silver nitrate, copper sulphate, grattage, expression, etc., the cicatricial process is simply hastened by chemical and mechanical destruction of the normal and abnormal tissue of the lids and the irritation resulting from these various measures.

Fig. 12.—Thickening and deformity of the lids produced by a long standing case of trachoma. Note that the outer two thirds of the right upper lid presents a curve which is concaved downward, while the normal eye has its concavity upward.

THE ILLUSTRATIONS

It is extremely difficult to get good illustrations of trachoma, as there are several things which interfere with accurate reproductions of the conjunctiva. In order to show the diseased area to the artist it is necessary to evert the upper lid. This procedure is more or less uncomfortable to the patient, and the lid cannot be maintained in this position for a very long period of time. The appearance and color of the conjunctiva itself changes from moment to moment on account of the varying blood supply and the irritation produced by the eversion.

Long training is essential in order that the observer should be able to grasp and appreciate quickly the very minute pathologic changes by which the different inflammatory diseases of the conjunctiva are diagnosed. It is extremely important that in all cases the culdesac should be carefully brought into view by proper manipulation of the tip of the glove buttoner. In most of the illustrations the entire culdesac is shown, but it should be remembered that in the actual work the examiner can see only one part of the culdesac at a time. Hence, in actual practice, it is impossible to get as complete a view of the diseased structures as is shown in the pictures.

The black and white drawings were made by Artist Leonard H. Wilder of the United States Hygienic Laboratory, after paintings made by S. Shimatori of actual cases occurring in immigrants at the United States Immigrant Hospital at Ellis Island, New York. They are as correct reproductions of the conditions seen as the artists could portray.

The illustrations were made three times the original size in order that the finer details on which so much depends in the diagnosis of trachoma might not be lost in the process of reproduction. It is advised that they be studied, first of all with a minus lens of sufficient strength to bring them down to the size of a normal eyelid, in order to get the general effect, and afterward with the naked eye for the purpose of observing the finer details.

U. S. Immigration Station.

City Celebrates New Water Supply.—October 12, New York began its celebration of the completion of the Catskill aqueduct. This aqueduct is approximately 120 miles long and its construction has covered a period of ten years. It has been completed, however, within contract time, without a labor strike, and its cost has been kept within the original estimate. The opportunity offered by the completion of this great work for teaching important civic lessons is not being neglected. The great influence of water supply on the public health is being impressed in the school celebrations and public meetings. For this purpose a pamphlet has been prepared by the department of health at the request of the Mayor's Catskill Aqueduct Celebration Committee which is being used as a text for compositions on this subject.

CESAREAN SECTION SCARS

A HISTOLOGIC STUDY OF FOUR SPECIMENS*

ALFRED BAKER SPALDING, M.D.
SAN FRANCISCO

Originally the indications for cesarean section were limited, because delivery by laparotomy without suturing the uterus, although occasionally successful, nearly always resulted in death from hemorrhage. Suturing the uterus to prevent death from hemorrhage was followed so frequently by peritonitis that Jorg,[1] in 1806, suggested a method of extraperitoneal cesarean section which was in fact successfully performed by Ritgen,[1] in 1821. Rarely repeated cesarean section was successful in preantiseptic days, in cases in which the adhesions were sufficiently extensive to wall off the peritoneal cavity. Porro, in 1876, devised his operation for removing the uterus and suturing the cervix into the laparotomy wound. While the Porro operation greatly reduced the mortality of cesarean section, the removal of the uterus was considered to be too radical a procedure to permit of any marked increase in the list of indications for cesarean section.

But when Sänger, in 1882, described his well known conservative operation, the immediate results were found to be so good in regard to fetal and maternal mortality that the original small list of indications for cesarean section was greatly increased.

It has been estimated that today cesarean section is resorted to about once in each 200 confinements, which probably is a fairly conservative statement. In hospitals and clinics the ratio may at times be even greater. For instance, at the Stanford Women's Clinic, eighteen cesarean sections have been performed in the last 2,060 consecutive confinements, or, on an average, one cesarean section for each 115 confinements.

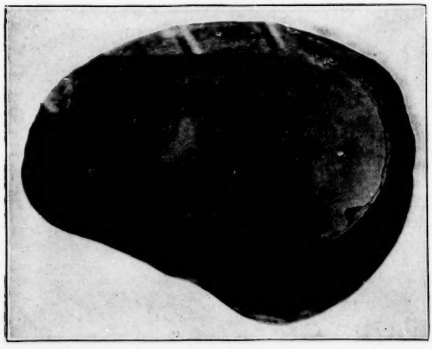

Fig. 1.—Cross section of the pregnant uterus at 18 weeks; wall outside placenta, 6 mm.; placenta, 22 mm.; wall under placenta, 5 mm.

The subsequent history of this large class of cesareanized women is a matter not only of scientific interest, but also of sociologic concern. The possibility of sterility, of abortions, of almost certain sterility after the second cesarean section, as well as future rupture of the uterus, must be thought of before resorting to the comparatively simple expedient of abdominal cesarean section, when possibly some other obstetric operation, such as pubiotomy or vaginal hysterotomy, might do as well and might give to the patient a simpler obstetric future.

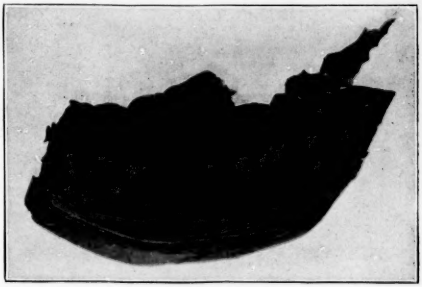

Fig. 2.—Placenta and uterine wall in first stage of labor: wall outside of placenta from 7 to 9 mm.; placenta, 22 mm.; wall under placenta, 6 mm.

After cesarean section, many patients have fever with more or less inflammation of the endometrium; many remain sterile after one cesarean section, either from choice, or because the operator has sterilized them; many abort after cesarean section spontaneously or are aborted through fear of future difficulties, while a relatively small number are repeatedly cesareanized. Some patients, after the classic Sänger or Fritsch operation, occasionally have a rupture of the uterus in succeeding pregnancies. Von Leuwin,[2] in 1904, and Singer,[3] in 1908, wrote valuable theses on this subject.

Weber,[4] in 1910, called attention to the fact that in the Münchner Frauenklinik the percentage of uterine ruptures had increased from one in 1,476 labors previous to 1899, to one in 697 labors since 1899. He attributes this increase in the number of ruptures to injuries to the uterus caused by previous operations, particularly to injuries caused by curettage in the puerperal period. Of twenty-eight ruptures during this operative period, one was through an old cesarean scar.

Krukenberg,[5] in 1886, reported twelve cases of rupture in twenty-four pregnancies after cesarean section.

Later Sänger stated that rupture had only rarely occurred after his operation, and that when it had occurred, it was because of poor technic on the part of the operator. As a result, the early reports of rupture dealt exclusively with cases in which some other operator performed the original cesarean section. However, Wyss,[6] in 1912, collected from the literature forty-three reports of rupture occurring

* From the Division of Obstetrics and Gynecology, Leland Stanford Junior University School of Medicine.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Quoted from Nürnberger: Zur Geschichte des Extraperitonealen Kaiserschnittes, Zentralbl. f. Gynäk., 1909, No. 33, p. 899.

2. Von Leuwin: Herhaaldi sectio caesarea, Thèse d'Utrecht, 1904, and Ann. de Gynec. et d'obst., October, 1904, p. 577.

3. Singer: Des cicatrices cesariennes abdominale classiques, Thèse de Paris, 1908-1909, p. 499.

4. Weber, F.: Die Kompletten Uterusrupturen der letzten 50 Jahre an der Münchner Frauenklinik, Beitr. z. Geburtsh. u. Gynäk., 1910, **15**, 53.

5. Krukenberg, G.: Beitrag zur Kaiserschnittfrage, Arch. f. Gynäk., 1886, No. 28, p. 409.

6. Wyss, Albert: Beitrag zur Uterusruptur nach Kaiserschnitt, Beitr. z. Geburtsh. u. Gynäk., 1912, **17**, 336.

since 1895, and Palmer Findley[7] has recently increased this list to a total of sixty-three. In addition to these, the following ruptures may be found reported in the literature; Banby and Gilles,[8] Cristalli,[9] Baisch,[10] Mabbott,[11] Wyder,[12] Weber,[4] Cameron[13] (two cases), Lüsebrink,[14] Bell,[15] and Rongy[16] (two cases).

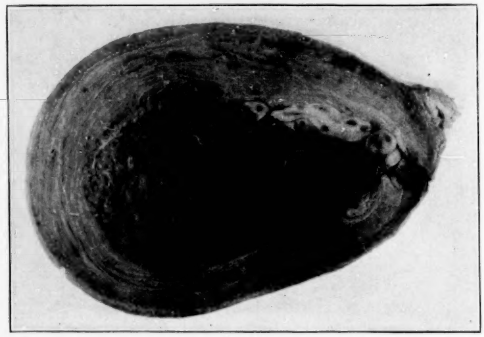

Fig. 3.—Sagittal section of the uterus and placenta in the third stage of labor: wall outside placenta, 28 mm.; placenta, 45 mm.; wall under placenta, 18 mm.

The frequency of rupture after cesarean section can at best be only roughly estimated. Couvelaire,[17] quoting from von Leuwin, made the statement, which is found so often in the literature, that rupture occurs in about 2 per cent. of pregnancies after cesarean section. As a matter of fact, von Leuwin stated in his thesis that 77 patients who became pregnant after cesarean section and were not treated by repeated cesarean section gave the following history: there were 8 spontaneous, and 3 artificial abortions, 6 ruptures of the uterus (dans la cicatrice ou ailleurs [in the cicatrix or elsewhere]), 22 prematurely induced labors, 21 spontaneous labors at term, 3 symphysiotomies, 3 embryotomies, three extractions with forceps, and 2 versions with extraction. In the paragraph following, he states that of a total of 194 pregnancies, including 117 repeated cesareans with the 77 previously mentioned, there were noted 24 defective scars. Of these, 4 were completely ruptured, 14 were defective to the peritoneal coat, and 6 were partly defective. From the first paragraph, one might conclude that there were 6 ruptures in 66 cases (by excluding the abortions) or more than 9 per cent. of ruptures. Or, from the second paragraph, one could agree with Couvelaire that the number of ruptures were four in 194, or about 2 per cent. However, the percentage (12) of defective scars agrees very well with the findings recently reported by Harrar.[18] Of 50 cases of repeated cesarean section at the New York Lying-In Hospital, there were noted 8, or 16 per cent. of defective scars.

Of forty cesarean sections in private practice or in my clinic, only one patient to my knowledge has had spontaneous labor later. This patient, reported by Breitstein,[19] had one normal spontaneous labor, and then the uterus ruptured spontaneously in the last month of the next pregnancy.

Laparotomy was performed by Breitstein twenty-four hours after the occurrence of the rupture, because the patient complained so little as to obscure the diagnosis. The uterus was found ruptured on the anterior wall in the old cesarean scar. The placenta lay outside on the anterior wall of the uterus. Around the edge of the rupture, there was an intense leukocytic infiltration in the decidua. The upper part of the rent was covered by the decidua vera. Around the central and lower parts, the decidua had the appearance of the serotina. The muscle in the upper part toward the peritoneum was normal.

Of the seventy-five reported cases in the literature, in only eighteen are there pathologic reports of the histology of the scars. Of these, two authors (Ekstein[20] and Breitstein[19]) report syncytial elements in the scars with good muscle healing; seven (Schick,[21] Couvelaire,[17] Dahlmann,[22] two cases, Fischer,[23] two cases, and Wyss[6]) report finding

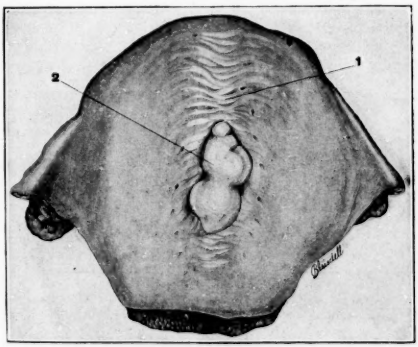

Fig. 4.—Drawing of hypothetic case to illustrate the author's idea of the cause of uterine rupture in defective cesarean section scars; *1*, defective scar; *2*, liquor amnii in membranes rupturing scar on principle of water edge.

7. Findley, Palmer: Rupture of the Scar of a Previous Cesarean Section, Am. Jour. Obst., 1916, **74**, 411.
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9. Cristalli, G.: Arch. di ostet. e. ginec., 1906, No. 12.
10. Baisch, K.: Uterusverletzungen und Schwangerschaftsruptur, Zentralbl. f. Gynäk., 1904, **59**, 1537.
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13. Cameron, J. M.: Demonstration of Specimen of Rupture After Cesarean, Edinburgh Med. Jour., 1911, **70**, 378.
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15. Bell, J. N.: Rupture of the Uterus in Cesareanized Women, with a Review of the Literature on This Subject to Date, Am. Jour. Obst., 1916, **74**, 950.
16. Rongy, A. J.: Rupture of the Cesarean Scar, Am. Jour. Obst., 1916, **74**, 954.
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19. Breitstein, L. I.: Rupture of the Uterus Following Cesarean Section, THE JOURNAL A. M. A. Feb. 28, 1914, p. 689.
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21. Schick, P.: Ueber einen Fall von Uterusruptur nach vorangegangenem klassischen Kaiserschnitt, Deutsch. med. Wchnschr., 1911, **37**, 1690.
22. Dahlmann, Albert: Zerreissungen der Gebärmutter nach Kaiserschnitt, Monatschr. f. Geburtsh. u. Gynäk., 1910, **32**, 33.
23. Fischer, O.: Ueber die Ruptur des graviden Uterus in einer alten Kaiserschnittnarbe, Ztsch. f. Geburtsh. u. Gynäk., 1912, **70**, 838.

placental elements in poorly healed scars. Two (Prüsmann[24] and Jolly[25]) found decidual islands in the scar as the sole cause of rupture, and Wolf[26] reports the same finding associated with poor muscle healing. In addition, many state that the decidua approaches, as one would expect, to the peritoneum

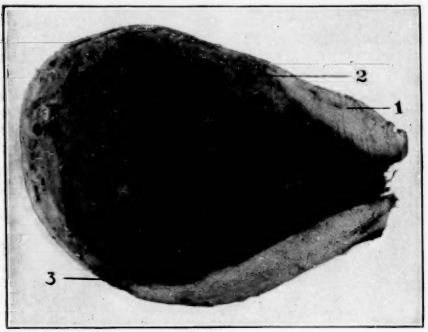

Fig. 5.—Sagittal section of the uterus and placenta with rupture of the uterus at site of old cesarean section scar: *1*, thickened lower uterine segment, 21 mm.; *2*, placenta, 15 mm. thick; *3*, point of rupture, old scar, 2 mm.

over the surface of poorly healed scars. Of the eighteen reports, thirteen record poor wound healing as the chief cause of rupture. Clinically, vomiting in late pregnancy, cervix bags, bougies, hydramnios, overtime fetus, ulcerating ventral hernia, long labor without engagement, manual extraction of the placenta, abdominal fixation of the uterus, version and pituitary solution have been noted to explain the rupture, while several cases are reported without strain of any kind and with few of the usual symptoms of uterine rupture. Some have been found unexpectedly at operation. Couvelaire thought the rupture in his case occurred to one side of the old scar through the uterine muscle, which agrees with the clinical reports by Krukenberg[5] and Davis,[27] and with the opinion of Mason and Williams,[28] based on animal experiments.

From 1895 to 1900, when the classic Sänger operation was in universal vogue, only three cases of rupture were reported. From 1900 to 1911, during the time when many resorted to the transverse fundus incision of Fritsch, forty cases of rupture were reported. Wyss condemned all operations except the Sänger operation, and believed the ruptures were due to infection and to poor technic. Several have mentioned that in the fundus, the postpartum contractions may loosen the sutures, and result in poor wound healing. German literature is full of good results following the extraperitoneal operation. Lichtenstein,[29] Reinhardt,[30] Scheffzek,[31] Rubeska[32] and Mayer[33] have reported labors lasting from five to sixty-eight hours without rupture, while Unterberger[34] states that no case has yet been reported of rupture following the extraperitoneal operation. However, Wolf[26] reports a case of rupture after a transperitoneal operation, and Labhardt[35] encountered rupture in a case of placenta praevia following delivery by Dührssens incisions in a previous confinement. In Findley's list of sixty-three ruptures, ten make mention of the placental site at the time of the first cesarean section. Of these, eight incisions were made into the placenta. Twenty-two mention the placental site at the time of rupture. Of these, nineteen find the placental site in or near the rupture.

It has frequently been suggested that the incising of the placental site might lead to imperfect healing of the regenerating endometrium, as well as the possibility of the developing placental elements weakening the scar, as happens in some cases of ectopic pregnancy. Both these facts could account for the better prognosis following extraperitoneal cesarean section.

While it is plausible that the placental elements might lead to poor healing of the wound in cases in which the incision is into the placental site, there is hardly sufficient evidence available to uphold the idea that the syncytium will attack sound scar tissue any more than it does sound uterine tissue. To verify this, we studied the uterus in a girl who died when she was eighteen weeks pregnant, and found that the wall was 6 mm. thick, the placenta 22 mm. in thickness, while the thickness of the wall underlying the placenta was 5 mm. (Fig. 1). The histology of the

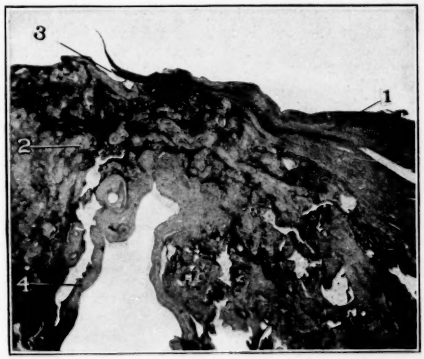

Fig. 6.—Low power photograph at point of rupture in Figure 5: *1*, muscle wall; *2*, placenta; *3*, point of rupture; *4*, amnion.

muscle wall differed from cesarean scars in being of looser texture, containing many more small blood vessels, less fibrous tissue, and no fibrin, except in the

24. Prüsmann, F.: Die Spontanruptur in der alten Kaiserschnittsnarbe, Ztschr. f. Geburtsh. u. Gynäk., 1905, **55**, 415.
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26. Wolf: Demonstration-Gesellschaft für Geburtschülfe und Gynäkologie zu Berlin, Ztschr. f. Geburtsh. u. Gynäk., 1914, **75**, 740.
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30. Reinhardt, J. C.: Bericht über zehn suprasymphysäre Kaiserschnitte, Gynäk. Rundschau, 1910, No. 24.
31. Scheffzek, Franz A.: Die Uterusnarbe des korporealen und cervikalen Kaiserschnitts und ihre Chancen bei späteren Schwangerschaften and Geburten, Ztschr. f. Geburtsh. u. Gynäk., 1910, **67**, 752.
32. Rubeska, W.: Wiederholter suprasymphysärer Kaiserschnitt, Zentralbl. f. Gynäk., 1910, **35**, 1164.
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34. Unterberger: Spontane Uterusruptur nach Sectio cesarea, Monatschr. f. Geburtsh. u. Gynäk., 1911, **34**, 372.
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decidua, where the chorionic elements formed attachment. The wall of the uterus in a woman dying in the first stage of labor (Fig. 2) measured from 7 to 9 mm. in thickness, except at the placental site, where it measured 6 mm.

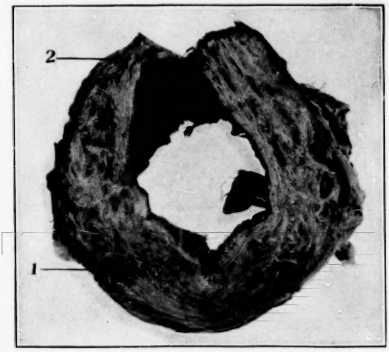

Fig. 7.—Cross section of uterus showing fresh cesarean incision and old cesarean section scar; good healing: *1*, muscle wall, 26 mm.; *2*, old scar, 9 mm.

From a Porro-cesarean section case (Fig. 3), the thickness of the uterine wall in the third stage of labor was found to be 28 mm. outside the placental site, and 18 mm. beneath the placenta. The thickness of the wall in the nonpregnant state was observed to be about 17 mm.

From these observations, it appears that the normal uterine muscle wall is somewhat thinner beneath the placenta than it is at other places, and it might be argued that a sound cesarean scar over the placenta would be thinned in the same proportion; but there is no histologic evidence to prove that the normal uterine wall or the well healed scar is weakened by the invasion of syncytium, such as occurs in mole pregnancy and in ectopic gestation.

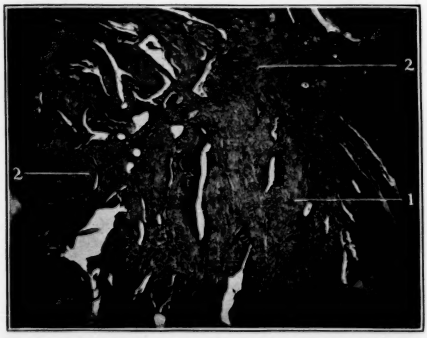

Fig. 8.—Low power photograph of old scar in Figure 7: *1*, normal muscle tissue; *2*, scar shows fibrous tissue; few muscle cells.

Histologically, the strong well healed scar is practically no different from normal uterine tissue. Defective scars, however, contain more fibrous tissue, fewer blood vessels, less muscle tissue, less elastic tissue, and when in contact with the placenta, more fibrin deposits. The placenta may actually protect a weak scar by acting as a splint to cover the wall defect. On the other hand, a small retroplacental hemorrhage might rupture the uterus. The most plausible reason to explain actual rupture of the uterus seems to rest on mechanical principles. Given a weak scar defective near to the peritoneal coat, a small water wedge of liquor amnii (Fig. 4) will cause the uterus to rupture, on the same principle that it causes the cervix to open. Scars in the lower uterine segment are protected more than scars in the fundus from this action. Using a cervix bag which increases the intra-uterine pressure will cause added danger. In the third stage of labor, retroperitoneal hemorrhage might well cause rupture.

In this connection I desire to report the following histologic findings of cesarean section scars:

REPORT OF CASES

CASE 1.—*History.*—A white woman, aged 32, was examined in consultation at an outside hospital, Sept. 13, 1916. The patient was in her third pregnancy. In 1914, the cervix had been amputated. The first labor occurred five years ago and it was a high forceps delivery, the child being delivered dead. The second labor took place three years ago, at which time a cesarean section was performed by a general surgeon; no fever occurred during the puerperium. The present labor was due Sept. 2, 1916, and the three measurements of the pelvis which had been taken were normal. The promontory was high and was palpated with difficulty; the pubic angle was acute. Labor began September 12 at 1 a. m. with strong pains. The position was breech, and at 1 p. m., September 13, the membranes ruptured and meconium was noted in the liquor amnii. The pains stopped, and 0.5 c.c. of pituitary solution was given, causing hard pains. At 2:10 p. m., under ether, the attending physician attempted to deliver the child by breech extraction, but could not extract the head. At this point the history is vague, but the result was that the body was severed, leaving the head in utero. At 7 p. m. the patient was moribund, with rapid pulse and continuous, although moderate, bleeding from the vagina. As there were no craniotomy instruments to be had in the hospital, and as it seemed probable that the uterus containing the fetal head was both ruptured and septic, an immediate hysterectomy was done. There were many adhesions on the anterior surface of the uterus, but no rupture of the cesarean scar appeared to

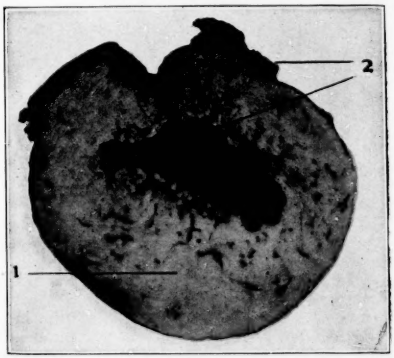

Fig. 9.—Cross section of uterus showing fresh cesarean incision and old cesarean section scar, good healing: *1*, muscle wall, 55 mm.; *2*, old scar, 28 mm.

be present in spite of the severe twenty-four hour labor and the use of pituitary solution. The patient died shortly after operation. After a delay of several weeks, I was able to obtain the specimen of the uterus for study. Unfortunately, the fixation of the large specimen was poor.

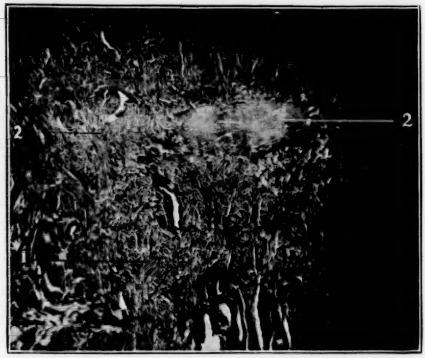

Fig. 10.—Low power photograph of old scar in Figure 9: *1*, normal muscle tissue; *2*, *2*, scar is practically the same as the normal uterine wall except for slight deposit of fibrin.

Pathology.—The specimen consisted of the uterus above the internal os (containing a large fetal head), right ovary and tube. There were many adhesions over the anterior and left lateral surfaces of the uterus. The uterus measured 18 cm. transversely at the line of tubal insertion; 14 cm. anteroposteriorly, and had a length of 22 cm. On the posterior wall of the uterus on the fundus just above the line of insertion of the fallopian tubes, there was an irregular white scar, 2.5 cm. wide and about 8 cm. long, which ran transversely and a little downward from left to right. The scar seemed to be held together and protected in a splintlike manner by the attached placenta beneath. The placenta had a very large attachment over the anterior wall, fundus, and part of the posterior wall of the uterus. The wall of the uterus was thickened to 22 mm. in the lower part of the uterus, extending posteriorly to a distance of 15 cm. (just to the old uterine scar), and 10 cm. on the anterior wall above the internal os. Beneath these points over the fundus, the wall was thinned to 5 mm., except at the site of the scar, which is 2 mm. The attached placenta was 15 mm. thick (Fig. 5).

Microscopic Examination.—Sections of the uterine wall revealed fairly distinct layers of normal muscle tissue with a thin layer of decidua. The placenta was in situ, and the villi were normal. At one point, the muscle tissue thinned out to a hairlike line, beneath which there was a layer of hemorrhage which overlay the proliferating villi. In places, the thin peritoneal coat was ruptured. This was at the site of the old cesarean incision. Beyond this, the muscle wall again thickened. In the scar, distinct muscle bundles were lacking and had been replaced with wavy fibrillar connective tissue (Fig. 6).

CASE 2.—*History.*—A white woman, aged 20, had a simple, flat contracted pelvis, the true conjugate measuring 7 cm. Labor was due Sept. 5, 1913, but the pains began August 23. It was a breech presentation, and the fundus measured 30 cm. above the symphysis, the presenting part being above the brim. The patient preferred the cesarean section to pubiotomy. At the operation, the incision was made in the midline below the umbilicus, and the uterine incisions in the midline on the anterior wall of the uterus into the placenta. The incision in the uterus was closed with two layers of interrupted chromic catgut (avoiding decidua), and one layer of continuous sutures. Lembert chromic suture was used in the peritoneum. Convalescence was normal, and no fever developed. Jan. 11, 1916, this patient returned to the clinic in labor with a vertex presentation. The fundus measured 34 cm., and the presenting part was above the brim. After nine hours of good labor pains without engagement of the presenting part, a Porro-cesarean section was done, as the patient requested sterilization.

The uterine incision was made in the midline on the anterior wall of the uterus into the placenta; the old incision was not visible. Convalescence was normal, and there was no fever.

Pathology.—The uterus measured 14 by 10 by 10 cm. There were no adhesions. The old scar was to the left of the recent incision and the wall was thinner and somewhat puckered. The wall of the uterus outside the old scar was 26 mm., while the scar measured 9 mm. (Fig. 7).

Microscopic Examination.—The scar showed much fibrous tissue with practically no muscle cells. There were a few blood vessels in the scar, but no decidual or syncytial elements were present. With Weigert's stain, the normal elastic elements seen in the muscle tissue were lacking in the scar. The scar appeared strong, although fibrous and shrunken (Fig. 8).

CASE 3.—*History.*—A white woman, aged 25, had a flat, rachitic pelvis. The true conjugate measured 9 cm., and between the tubera ischii, 7.5 cm. The patient was delivered by cesarean section in the Cooper College Clinic, April 12, 1912. Interrupted catgut sutures and continuous Lembert sutures in the peritoneum were used. Convalescence was normal except for a fever of 101.6 F. on the day of operation. Nov. 16, 1916,

Fig. 11.—Anterior surface of uterus with defective old cesarean scar, showing adhesions: *1*, recent cesarean incision; *2*, old cesarean section scar; *3*, cervix.

this patient reported to the Stanford Clinic in labor. The fundus measured 34 cm. above the symphysis. It was a breech presentation, but no engagement had as yet occurred, although the membranes were ruptured. After two hours of pains, the patient was delivered by Porro-cesarean section,

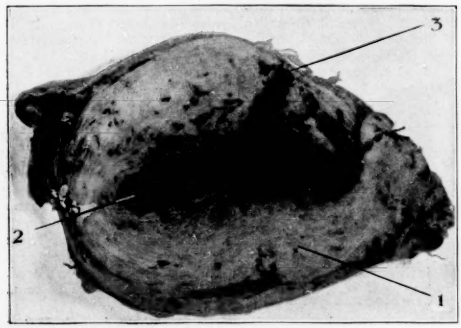

Fig. 12.—Sagittal section of the uterus shown in Figure 11, with defective old cesarean section scar: *1*, muscle wall, 38 mm.; *2*, decidua, 6 mm.; *3*, defective scar, 1.5 mm.

as she requested sterilization, and the membranes had been ruptured since labor began. Incision was made through the right rectus below the umbilicus. There were adhesions between the uterus and the anterior wall. The uterine incision was made on the anterior wall. The placenta was located on the posterior wall of the uterus. Convalescence was normal, except for temperature of 101 F. on the first day and the eleventh day.

Pathology.—The uterus measured 11.5 by 11 by 9 cm. There were no adhesions except at the line of the old scar, which was 4.5 cm. long. The scar on the upper part of the anterior surface was in the midline, and the uterine wall in its thickest part was 55 mm. The endometrium was thick and shaggy; the scar was 28 mm. thick. The placenta was inserted on the posterior wall (Fig. 9).

Microscopic Examination.—The scar was the same as the other muscle tissue, except for slight fibrin changes and slight depression in the mucous membrane. It was stained with the van Gieson stain, hematoxylin and eosin stain and with the Weigert stain for elastic tissue. In part the muscle fibers were not quite so compact, but the amount of elastic tissue was about normal (Fig. 11).

CASE 4.—*History.*—A white woman, aged 26, pregnant for the second time, came to the Stanford Women's Clinic, Sept. 7, 1916, in the seventh month of pregnancy. Twenty-one months previously she had had cesarean section at term performed by a surgeon in Sacramento, after twenty-four hours of labor. The pelvis measured 24, 26, 29.5, 21 and 20 cm. The laparotomy scar extended from the ensiform around the left side of the umbilicus to a point midway between the umbilicus and symphysis. A ventral hernia occupied the line of the old incision. No history of the convalescence was available.

A Porro-cesarean section with repair of the hernia was performed, Dec. 5, 1916, at the request of the patient that she be sterilized. There were very few light adhesions encountered. The uterine incision was in the anterior wall to the left of the old scar, and the placenta was on the anterior wall of the uterus. Convalescence was normal except for a temperature of 101 F. on the day of operation.

Pathology.—The uterus, consisting of body and fundus to the internal os, measured 15 by 13 by 8 cm. The old scar was blue, 8 cm. long, 1.5 mm. thick and 15 mm. wide. The wall of the uterus opposite the old scar was 38 mm. thick, and the mucous membrane was 6 mm. thick (Fig. 12).

Microscopic Examination.—Sections of the scar revealed a thin layer of peritoneal tissue with attached adhesions. Beneath this layer, there was a very thin layer of muscle tissue, but no fibrous tissue. There was a thin layer of decidua containing much fibrin, and attached to this was the placenta. On either side of the scar, there was much fibrin deposit enclosing decidua, fetal cells and muscle fibers. There were many masses of syncytium to be seen some distance away from the scar between the muscle bundles. There was about the same amount of elastic tissue in the scar as in the muscle tissue on either side. This was mostly associated with small blood vessels (Fig. 13).

CONCLUSIONS

1. It seems justifiable to conclude that more than 10 per cent. of cesarean section scars are defective.

2. The chief cause for the defect seems to lie in imperfect healing of the endometrium.

3. In case the incision is into the placental site, there may be imperfect healing due to the degeneration of decidua serotina, or the scar may be weakened by the inclusion of decidual tissue in the muscle wall.

4. There is not much evidence to uphold the view that the syncytium attacks the well healed scar, although two such cases have been reported.

5. The placenta is frequently found overlying the weakened scar in cases of rupture. This may produce rupture from retroplacental hemorrhage, or may act as a splint to support the weakened scar.

6. Of seventy-five reported cases, all but one were ruptures in the upper part of the uterus. From this it seems that the extraperitoneal cesarean section carries with it a better prognosis than the classic abdominal operation.

Fig. 13.—Low power photograph of old scar in Figure 12: *1*, normal muscle tissue; *2*, scar shows peritoneal coat with very thin layer of muscle tissue covered with decidua; *3*, placenta on scar.

7. Rupture of the uterus is probably produced by the increased intra-uterine pressure forcing a water wedge into the defective scar.

8. Although well healed scars can withstand the strain of future labors, the frequency of rupture after cesarean section is so much greater than uterine rupture from other causes that the indications for cesarean section should not include such patients as can just as well be treated by the induction of labor at term, pubiotomy, vaginal hysterotomy, or other well known obstetric operations.

Lane Hospital.

ABSTRACT OF DISCUSSION

DR. J. R. LOSEE, New York: During the past four months at the New York Lying-In Hospital we have made a histologic examination of a series of cesarean section scars. This work was undertaken to determine, first, if uterine muscle would completely regenerate after being incised, and second, the actual cause of rupture late in a succeeding pregnancy. In this series the tissue was obtained from nine cases in which there was a complete or a partial rupture of the uterus, and from eleven in which the incision was made either through the old scar or adjacent to it at the subsequent operation. Of the nine cases of rupture, two presented a utero-abdominal fistula, in seven the whole scar was laid open, and in three of these the placenta and fetus were in the peritoneal cavity. There was no fat in any of the muscle cells. Of the eleven excised scars, five were moderately strong, and in four of these the placenta was attached directly beneath the wound, which fact suggests that the location of the placenta has little effect on the scar, providing there was firm union after the preceding section. There were six cases which presented rather thin scars, and the location of the placenta was equally divided, three being observed on the posterior wall and three on the anterior wall. From this series I have formulated the following conclusions:

1. The strength of the uterine scar after cesarean section depends on the absence from the wound of infection and foreign material, and on the perfect coaptation of the incised surfaces.

2. A perfectly healed wound leaves the myometrium as strong after operation as before, as far as can be determined by the histologic examination of the tissue in the line of the former incision.

3. A continuous suture in the myometrium adjacent to the decidua may assist in preventing the separation of the cut surfaces by blood clot or lochia in addition to the usual interrupted suture through serosa and myometrium.

4. The placenta in a subsequent pregnancy has little or no effect in weakening the firmly united scar, but if the scar is already weak it may accentuate this weakness.

5. Other than a small amount of fibrous tissue beneath the peritoneum, the myometrium in line with the former incision contains no scar tissue and the uterine muscle regenerates.

6. Rupture invariably takes place through the site of the former scar, and not through the adjacent muscle tissue.

7. Without definite means of estimating the strength of the uterine scar after cesarean section, subsequent pregnancies must be repeatedly observed as they approach term.

DR. ASA B. DAVIS, New York: From all parts of the obstetric world reports are accumulating of rupture of the uterus in labors subsequent to former cesarean delivery. One important factor in the lack of strength and proper union in uterine wounds is the absence of muscle sheath, on which we depend so much for strength in other lacerations, as, for instance, in abdominal closure. Another important factor is the uneven thickness, at times, of the uterine muscle, partly due to the retraction and contraction of the uterus. Many times the edges of the uterine wound are of even thickness on both sides. Then accurate apposition and closure by sutures is possible. We see cases, however, in which one side of the uterine wound may be an inch or more in thickness while the opposite side may be one third as thick in places. Here accurate apposition is impossible. Another cause of thin scar may be found in the attempt to secure close approximation; too great tension is made on the sutures. In the healing process these sutures cut into the soft muscle and allow separation, usually more on one side of the uterine cavity. Considerable tension must be made on the sutures, otherwise there is failure of apposition throughout the whole thickness of the edges of the wound.

We find a considerable number of women in active labor subsequent to cesarean section, and often the placenta in these cases is located under the entire length of the former cesarean scar, and yet rupture of the uterus has not taken place. It is doubtful if rupture of the uterus is due to fault in any particular technic in suturing the uterine wound, because no two operators use exactly the same technic, and yet many different operators are reporting cases of rupture of the uterus in labors subsequent to cesarean delivery. Some operators feel sure that their particular method of suturing the uterus is a successful one. I had as much reason to feel that way as any one until after my thirty-ninth cesarean section. Then a rupture through the uterine scar occurred. Since then seven or eight others have been added to my list. All but one have been hours in labor; one mother died.

DR. JAMES A. HARRAR, New York: There is no question that the uterine scar is often an unknown factor in a succeeding pregnancy. We must reduce that factor (1) by avoiding the classical operation when infection is suspected; (2) by proper care in suturing the uterine incision. Rupture occurs in a weakened scar, and it is weak because the original wound sloughed, or because it was not properly sutured.

Dr. Spalding's photomicrographs are valuable because such studies are rare. But I cannot admit that they prove that the syncitial cells erode the scar, comparable to the erosion in a ruptured ectopic pregnancy. The scars were thin, some only peritoneum and mucous membrane. There was an excavation on the under surface because of poor union. But the placenta simply grew into and filled the excavation; it did not make it. Its location under the scar was merely a coincidence.

On the first division at the New York Lying-In Hospital there has been but one rupture in sixty repeated cesarean sections. A thinned scar occurred nine times. In thirty-five the scar was solid, and in fifteen additional it was not materially defective. In six with normal scar the placenta lay directly under the second incision.

Sometimes we have to suture a contracted uterus whose walls are an inch or an inch and a quarter in thickness; here the sutures must be tied firmly. Sometimes, despite ergot and pituitary extract, the uterus remains relaxed and the wall thin. Here the sutures must be tied more loosely to permit of the thickening of the tissue in the grasp of the suture when the uterus contracts down.

Carefully identify and approximate the deeper edges of the incision. The deeper edges tend to retract away from the operator's attention. Do not take too wide a bite with the running suture in the visceral peritoneum, as very wide folds of peritoneum pulled across the line of deeper sutures cause the inner edges of the wound to gape.

In repeated cesarean sections it is better to excise the old uterine scar, whether it is solid or not. A parallel incision would give us two points of doubt in a still later pregnancy, and besides, suture of scar tissue is always poor surgery.

DR. NATHANIEL R. MASON, Boston: In 1910 I carried out a series of experiments with Dr. John T. Williams on pregnant cats and guinea-pigs in the laboratory of surgical research of the Harvard Medical School, with the object of determining the relative strength of scar and uterine wall. The following method was employed: a cesarean section was performed on a pregnant animal. Then, after a period had elapsed equal to the length of pregnancy for the given animal or near the end of a second pregnancy, the animal was killed and a section of the uterine wall containing the scar tested by suspending weights to it. These weights were gradually increased until rupture of the tissue was produced. It was found that rupture invariably took place in the uterine muscle and not in the scar.

In a recent review of 393 cesarean sections performed at the Boston Lying-In Hospital between July 15, 1894, and Nov. 24, 1916, it was found that 106 of these were repeated sections. These 106 repeated sections were performed on 73 women; that is, second sections were performed on 49, third sections on 19, fourth sections on 2, fifth sections on 2 and a sixth section on 1. In many instances these repeated cesarean sections were performed before the advent of labor, but there was also a large number of cases in which the operation was performed after labors of varying length of time. In not a single instance did any one of these 106 patients come to grief, either in pregnancy or labor because of rupture of a former cesarean section scar. In a considerable number of these former cesarean section cases, normal delivery was allowed to occur, and in others labor was terminated by operative vaginal delivery, including forceps operations, breech presentations and internal podalic version followed by manual extractions. No untoward results occurred.

Dr. Charles M. Green lays stress on the importance of allowing active labor to become established before the performance of a cesarean section, in order to obtain a thickened uterine wall. He believes that sutures placed in such a wall produce a stronger, thicker scar than when placed in the thinner wall of a uterus before the advent of labor. Any marked deviation in the method of closure from the principles laid down by Sänger results in a scar of less strength. Dr. Spalding has called attention to the fact that only three cases of rupture were reported between 1895 and 1900 when the classical Sänger operation was the only one performed.

It is well known that great speed in the performance of a cesarean section has been one of the objects striven for almost universally in the past, and is still the aim of some operators, even at present. The result of this practice has left the uterus insufficiently sutured, with faulty apposition of the cut edges of its wall, and a weak thin scar has been the sequence.

Two essential points in the technic of closure of the uterine wall are to be observed. One is the inclusion of the entire thickness of the muscle of the uterus in the suture. The innermost muscular layers often retract to such an extent that great care in the suturing is necessary to secure proper coaptation of the entire length of the incision. The other point is to place a deep suture through the uterine musculature both above the upper angle and below the lower angle of the wound, because at these points splits in the muscular tissue of the uterus frequently occur in the extraction of the body and head of the child. Proper suturing of the wound and healing without infection are indispensable in securing a good scar. A well sutured scar, followed by a convalescence free from infection, can safely be subjected to the strain of subsequent pregnancies and labors. Rupture of such a scar should occur with no greater frequency than does rupture of the normal pregnant uterus.

DR. SAMUEL W. BANDLER, New York: After ordinary laparotomy, more than 10 per cent. of abdominal wounds do not heal well, so far as a good scar is concerned. We may expect the same in a hurried cesarean section. I never use chromic catgut. I do not consider it an advisable suture for such a delicate structure as uterine muscle. We should, as much as possible, operate in clean cases. The result is always better when the patient has not been examined too much and when operative vaginal procedures have not been tried. If we do not unite the lower areas of the abdominal wall, especially the peritoneum, and vomiting and straining cause the peritoneum to separate, we will, in an occasional case, have a protrusion of the intestines right through up to the skin. The same thing holds in cesarean section cases. We must pay more attention to the depths of the wound, especially the uterine lining. I always give pituitary extract before making the abdominal incision, and therefore have a firmly contracted uterus to sew. I pass No. 2 iodin catgut, often double, through the uterus half an inch from the lower end of the incision so that it comes out through the depth of the wound close to the uterine lining. The needle is then passed through one side and then through the other, catching a good hold of the uterine muscle just above the decidua. This is passed in the same manner as a subcuticular suture is passed. At the upper end the needle then passes through the depth of the wound, coming out through the surface of the uterus half an inch or an inch above the upper margin of the wound. This suture is then pulled on and the uterine lining or decidua is brought closely together. When the ends are tied, the uterine cavity is walled off from the wound and no blood from the cavity of the uterus intrudes itself. The uterine walls themselves bleed scarcely at all, and one can leisurely sew the two raw surfaces together. As the interrupted or continuous suture is passed, the finger in the depth of the uterine wound guards the point of the needle so that it comes out as close to the uterine lining as possible, and dead spaces are thus avoided. A suture is passed to unite the peritoneal edges of the uterus, no attempt whatever being made to invert it. For several days after the operation ergotin is given by needle to keep the uterus contracted to the size it was when the operation was completed.

DR. J. H. CARSTENS, Detroit: I am glad that Dr. Bandler objected to chromicized sutures. I use plain catgut; I want it to absorb quickly. All that is needed is to keep the wound together for a few days. I think in all instances of cesarean section for narrow pelvis the patients naturally need another cesarean section. I do not wait until these patients have been in labor for two or three days. I take charge of them and get them in the hospital a week or so before the time of labor and prepare for operation before labor sets in. Then I am sure there will be no strain on the scar, and I will never have any trouble about the rupture of the scar. Once in a while a patient will wait until labor. Then I rush her to the hospital as soon as possible. The first thing I do is to rupture the membrane in order to relieve the pressure. By doing these things there will be fewer cases of rupture than otherwise.

DR. E. GUSTAV ZINKE, Cincinnati: Recently I have been thoroughly absorbed in the theories concerning the healing of the uterine incision after cesarean section and its behavior in subsequent pregnancy and labor. One of the conclusions I have reached is that it matters little what suture material we use in sewing up the wound, but that it is most important that we have an aseptic wound, that we bring the sides of the incision into perfect apposition and unite the peritoneum securely over it. This procedure is absolutely essential to a firm uterine scar.

Much has been said concerning the dictum, "Once a cesarean section, always a cesarean section." That can hold true only in those cases in which the conditions persist which made the first cesarean section necessary. When hysterotomy is performed for placenta praevia, or eclampsia, a perfect uterine scar will admit of spontaneous delivery in subsequent pregnancies.

But when do we have a perfect scar? Though Whitridge Williams and others maintain that an undisturbed recovery from a cesarean section is the best indication that the uterine wound is firmly united, does this statement hold true in every case? When there is no obstruction in the parturient canal and the presentation and position of the child are favorable, when obliteration of the cervix and dilatation of the os proceed promptly, and the first stage of labor has been completed, the cesareanized woman will deliver herself, undoubtedly, if she has a solid uterine scar. She should, however, be delivered in a hospital so that, if rupture of the wound does occur, the abdomen may be opened at once with a view to saving both lives. But in all cases in which the indications for cesarean section persist, cesarean section is the only proper operative intervention.

DR. ALFRED B. SPALDING, San Francisco: I shall not enter into any discussion concerning technic. Dr. Zinke has mentioned a point which to my mind is of the utmost importance regarding cesarean section: The growing list of indications for the operation should be curtailed. I have seen cesarean section performed on women with normal pelves, because their physicians allowed the pregnancy to go overtime, when a dose of castor oil and quinin would have prevented cesarean section. I have seen cesarean section for breech presentation. In eclampsia the mortality is not greatly reduced by cesarean section over other obstetric procedures. In conditions such

as placenta praevia, I think we should hesitate before doing cesarean section at the first sign of hemorrhage. We should first ascertain the kind of placenta praevia we are dealing with before resorting to section. Because cesarean section is technically so easy to perform, many men not well trained in obstetrics are dabbling with something they have no business tampering with.

THE COLLOIDAL GOLD TEST

THE PREPARATION OF THE COLLOIDAL GOLD SOLUTION AND ITS APPLICATION TO DISEASES OF THE CENTRAL NERVOUS SYSTEM *

J. H. BLACK, M.D.
LOUIS ROSENBERG, B.S., M.D.
AND
R. B. McBRIDE, M.D.
DALLAS, TEXAS

I. THE PREPARATION OF THE REAGENT

J. H. BLACK, M.D., AND LOUIS ROSENBERG, M.D.

To one who has even a casual acquaintance with the literature of colloidal gold solutions, three things are at once apparent: 1. There is a general agreement that satisfactory solutions are difficult of preparation. 2. There are approximately as many variations in technic as there are workers. 3. There is unanimity of opinion that the use of the solution in the diagnosis of diseases of the central nervous system has a very definite value.

The major portion of the work done in this country has been carried on with a more or less close adherence to the technic of Lange,[1] variations being introduced by the individual worker in the effort to produce uniform results. It is quite true that many men have been able to produce satisfactory solutions — some of them with considerable regularity — but the inability to secure continued duplication of results, together with the irregular behavior of some of these apparently good solutions, makes it evident that all the conditions necessary to the production of a good solution are not known, and that the standards by which these solutions are judged are insufficient.

A very marked advance in our knowledge of these conditions was made by the report of Miller, Brush, Hammers and Felton.[2] They propose a method which, if carefully followed, will give uniform results, and devised means by which these solutions which appear satisfactory but are not can be detected. Our own experience led us quite early to the conclusion that their claims were well founded and their technic quite dependable. Feeling, however, that the requirements as to equipment, time and complexity of detail might serve to deter many men from as general a use of the reagent as its value deserves, we entered on this work with the purpose of determining to what extent simplification might be carried without interference with uniformity of results. The technic of others has been used on occasion to check findings and with the desire to clear up certain points, but the work of Miller and his associates was the basis of this work and was accepted as standard technic.

As soon as it was evident that this method produced uniformly good solutions, work was begun retaining the original technic with the exception of one factor, and variations in this one factor — all other conditions remaining constant — were used to determine their influence on the character of the solution. Our findings, as based on the preparation of 367 solutions, can probably best be presented by separate, brief statements relative to each factor, with tables appended detailing experimental data when it is believed such information might be of value.

Distilling Apparatus.—The apparatus used for the first thirty-nine solutions consisted of resistance glass flasks, block tin tubing, and cork connections. The tin tube was bent near one end forming a wide arc. The short vertical section of tubing projected through a tight fitting cork into the distilling flask. The long vertical section of tubing was surrounded by a condenser jacket and passed through a loose fitting cork into the receiving flask. This simple apparatus gave entire satisfaction. For the greater portion of the work a 3 gallon copper, tin-lined still was used.

Method of Distillation.—The flame is turned high and the first distillate comes over rapidly, while no water flows through the condenser jacket, the steam cleaning the tube. After about 200 c.c. with the small apparatus, and 1,000 c.c. with the larger, have come over, the flame is cut down until the water flows in discrete drops into the receiving flask. Distillation is stopped when approximately four fifths of the contents of the distilling apparatus have come over.

Number of Distillations.—Beginning with one distillation with a Stokes still followed by two in the above described apparatus, we soon found that, by carefully distilling, a single distillation with this apparatus without preliminary treatment was entirely satisfactory, and this became routine procedure. Water once distilled in a Stokes still was found to vary so widely at different times that it was not to be depended on, although, in one instance, excellent solutions were obtained by its use.

Storage of Water.—Singly distilled water has been stored at room temperature in clean resistance glass flasks and has proved satisfactory after thirty-four days. No attempt was made to determine this further. In ordinary glass the water has been found satisfactory after forty-two days. We believe that the age of carefully distilled water has no influence on the character of the gold solution. Indeed, Zsigmondy[3] states that doubly distilled water improves with age through a settling of the particles contained.

Cleaning of Glassware.—New glass was used and was, of course, used for nothing else. Hot soap and water for thirty minutes was followed by careful brushing under the tap; then hot dichromic acid solution for thirty minutes followed by careful rinsing under the tap, then with distilled water. If this procedure was carried out as the initial cleansing, it was found that much of this could be omitted at subsequent times. Beakers used on one day stood over night filled with tap water and were used with satisfaction after careful brushing and rinsing. Beakers stood inverted on filter paper on the laboratory table for one week and were used after only brushing and rinsing. Good solutions resulted. Pipets used for measuring reagents were wrapped in filter paper after use and used twelve days later after rinsing with distilled water. Good results were obtained. Glassware

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Lange: Berl. klin. Wchnschr., 1912, **49**, 897; Ztschr. f. Chemotherap., 1913, **1**, 44.

2. Miller, Brush, Hammers and Felton: Bull. Johns Hopkins Hosp., **26**, 298, 391.

3. Zsigmondy: Colloids and the Ultramicroscope, New York, 1909.

which is not thoroughly clean is, in our opinion, the cause of the vast majority of protected solutions. Glass cleaned and used according to the foregoing statements should eliminate protected solutions with a minimum of labor.

Reagents.—Merck's chemicals were satisfactory, as were Baker's. Schering and Glatz' formaldehyd solution gave satisfaction. It was found that all reagents could be used as stock solutions. These were frequently used over a period of thirty days. Indeed, one formaldehyd solution was found satisfactory after three months. The only precautions used were to insure clean water, clean flasks kept tightly corked, and accurate measurements.

Preparation of Colloidal Solution (100 c.c. being used as a basis for discussion).—A beaker containing 100 c.c. of water is placed on wire gauze over a high flame. One c.c. of the 1 per cent. gold chlorid solution is added, followed by 0.7 c.c. of the 2 per cent. potassium carbonate. Heating is rapid, and at incipient boiling 0.5 c.c. of 1 per cent. formaldehyd is added. The solution should be vigorously stirred until reduction is complete. This should not require more than two minutes.

Comments on Technic of Preparation.—We have not found it necessary to add the gold and alkali at any particular temperature. Satisfactory solutions have been made by adding reagents to cold water and rapidly heating to boiling. The temperature at which the formaldehyd is added is, however, of much importance. If added at a low temperature, vaporization of a considerable quantity of formaldehyd may occur, leaving an amount insufficient for complete reduction of the gold. If added at a high temperature, the rapidity of the reaction is so increased that the loss by vaporization is negligible. Using the stated quantity of formaldehyd, we have obtained good solutions with equal ease at 90 C. and with vigorous boiling.

The, use of oxalic acid has, in our experience proved unnecessary.

DISCUSSION

The equation representing the reactions occurring in the preparation of the colloidal gold solution is, we believe:

$$9K_2CO_3+4AuCl_3+6HCHO=6HCOOK+2Au_2+3H_2O+9CO_2+12KCl$$

This equation may be proved by some results of our work, and it throws much light on other phases of the problem.

Influence of Alkali.—Calculation from the equation shows the amount of alkali required to maintain equilibrium with the gold chlorid used to be 0.01027 gm., which is contained in 0.513 c.c. of the 2 per cent. solution. It is evident that the formaldehyd is oxidized to formic acid, the amount of acid produced being neutralized by the amount of alkali over and above that required for the initial equilibrium with the gold. This added amount, according to the equation, is 0.171 c.c. of the 2 per cent. solution, making a total of 0.684 c.c. of the 2 per cent. solution required.

Table 1 illustrates a series of colloidal gold solutions made with potassium carbonate, varying in amount from 0.4 to 1.5 c.c. It will be noted that increase of alkali above 0.684 c.c.—the amount calculated from the equation—causes no shimmer, but gives beautiful solutions until more than 1 c.c. was used. Then the solutions were quite turbid and reduction occurred immediately on the addition of the formaldehyd. These solutions were, of course, alkaline. Decrease of alkali could be carried to 0.5 c.c., at which point pale blue solutions were obtained only after prolonged heating. Theoretically, we should expect to find reduction taking place in direct ratio to the decrease in the amount of alkali, the solution becoming lighter in color as the amount of reduced gold decreases, and the limit at which reduction is completely absent

TABLE 1.—INFLUENCE OF ALKALI

Amount of 2 Per Cent. Solution C.c.	Reaction	Character of Solution
.4	.....	No reduction
.5	Alkaline	Pale blue
.515	Alkaline	Reddish-blue
.525	Alkaline	Decided shimmer
.550	Alkaline	Faint shimmer
.575	Alkaline	No shimmer
.6	Alkaline	No shimmer
.625	Neutral	No shimmer
.650	Neutral	No shimmer
.675	Neutral	No shimmer
.7	Neutral	No shimmer
.725	Neutral	No shimmer
.750	Alkaline	No shimmer
.775	Alkaline	No shimmer
.8	Alkaline	No shimmer
.825	Alkaline	No shimmer
.850	Alkaline	No shimmer
.875	Alkaline	No shimmer
.9	Alkaline	No shimmer
.925	Alkaline	No shimmer
.950	Alkaline	No shimmer
.975	Alkaline	No shimmer
1.0	Alkaline	No shimmer
1.25	Alkaline	Turbid
1.5	Alkaline	Turbid

should be somewhat below the amount calculated as required. That this is borne out by the experimental data may be seen.

Although 0.513 c.c. is the amount of alkali required for equilibrium with the gold, reduction will occur at as low as 0.5 c.c., but even at 0.525 c.c. reduction is evidently incomplete. Addition of further alkali to these bluish solutions produces an immediate change to the red of a fully reduced gold, but we were unable to get brilliant, transparent solutions in this way. We believe we are dealing here with a partial reduction of all the gold, and that the situation is analogous to the partial reduction with minimum amounts of formaldehyd which is discussed below. The partial reduction here may be explained on the basis that, according to the mass law equilibrium, there must be a few potassium carbonate molecules which by their dissociation would yield the small amount of alkali necessary to permit partial reduction. One might expect a cycle which would eventually lead to complete reduction. This, however, is prevented by the presence of the potassium chlorid (and potassium formate), which represses dissociation of the few free potassium carbonate molecules. When it is remembered that formaldehyd acts as a reducing agent only in an alkaline medium, we have a possible explanation for the behavior of the solutions which Miller and his associates found did not reduce with the stipulated amounts of reagents. Using oxalic acid, measured in drops, which probably permitted variation in amount, this probably neutralized the free alkali and prevented reduction.

Influence of Formaldehyd.—Calculated from the equation, the amount of formaldehyd required to completely reduce the gold is 0.001486 gm., the amount contained in 0.1486 c.c. of the 1 per cent. solution. Reference to Table 2 shows that the amount of formaldehyd may be increased to 5 c.c. without producing any shimmer. Decrease in amount was possible to 0.13 c.c. Below this point blue, opaque, solu-

tions resulted. Below 0.45 c.c. the solutions were alkaline. The time required for reduction varied inversely with the amount of formaldehyd. If, to those solutions whose color is unsatisfactory because of the use of insufficient formaldehyd, further formaldehyd is added after reheating the solution, beautiful *satt rot* (intensely red) solutions which are neutral in reaction may be obtained. We have been able to convert an opaque, blue, alkaline solution, made with only 0.1 c.c. formaldehyd, into a beautiful, neutral solution by this method. By reference to Table 3 it will be seen that these "corrected" solutions give typical curves with a paretic spinal fluid.

Influence of Carbon Dioxid.—With an ammonia-free water it should be evident that "the gases in the water"[4] play no part in the determination of the quality of a solution, for carbon dioxid is produced in the reaction; and whether the temperature is maintained at 90 C. or brought to boiling is immaterial, for the difference in the carbon dioxid coefficient at 90 C. and at 100 C. is too slight to affect the solution, and even at 100 C., carbon dioxid, is not entirely removed, but has the absorption coefficient of 0.2438.[5]

Inflence of Method of Heating.—Solutions made properly are neutral in reaction to alizarin. If heating has been slow and the formaldehyd is added before the boiling point is reached, vaporization of the formaldehyd will be excessive, resulting in incomplete reduction and alkalinity. Depending on the amount of formaldehyd lost by evaporation, the solution may be a deep red, a light red, or blue and opaque. These variations may be produced without varying the amount of formaldehyd, if the method of heating is changed.

Solutions made in the ordinary way, without stirring after the addition of the formaldehyd, usually do not give brilliant color without shimmer; yet stirring may be dispensed with if the solution is made in the water-bath.

TABLE 2.—INFLUENCE OF FORMALDEHYD

1 Per cent. Solution, Quantity C.c.	Time for Reduction	Reaction	Color
.1	Slow	Alkaline	Blue
.11	Slow	Alkaline	Blue
.12	Slow	Alkaline	Blue
.13	Slow	Alkaline	Good
.14	Slow	Alkaline	Good
.15	2 minutes	Alkaline	Good
.2	2 minutes	Alkaline	Good
.25	1½ minutes	Alkaline	Good
.3	1⅔ minutes	Faintly alkaline	Good
.35	1 7/12 minutes	Faintly alkaline	Good
.4	1½ minutes	Faintly alkaline	Good
.45	1 9/20 minutes	Neutral	Good
.5	1⅙ minutes	Neutral	Good
1.0	1 minute	Neutral	Good
2.0	½ minute	Neutral	Good
3.0	⅓ minute	Faintly acid	Good
4.0	¼ minute	Acid	Good
5.0	⅕ minute	Acid	Good

Since it is evident that the limits within which the alkali and formaldehyd give good solutions are wide enough to embrace any amount of inaccuracy of measurement of a careful worker, and the carbon dioxid tension can have no influence on the solution, and since the manner of heating produces such definite effect, we feel that we are justified in believing that if the technic described above is followed, solutions with shimmer—slight or excessive—can be due to only one cause, namely, slow or irregular heating.

Catalytic Oxidation of Formaldehyd by Colloidal Gold.—Lange's original technic[1] called for 1 c.c. of a 2 per cent. potassium carbonate and 1 c.c. of a 1 per cent. formaldehyd. Neutral solutions can be obtained by this method. Since this is more alkali than is required according to the equation given above, the neutrality of reaction can be explained only on the basis of the colloidal gold acting as a catalyst and causing oxidation of the formaldehyd in excess to formic acid, which then reacts with the excess potassium carbonate. Indeed, it seems probable that solutions made with smaller amounts of alkali are neutral for the same reason. If the calculated amount of potassium carbonate is used, the final reaction of the solution we would expect to be alkaline, owing to the hydrolysis of the potassium formate and the potassium carbonate liberated from its equilibrium with the gold chlorid when the latter is completely reduced. Since the solutions are not alkaline, we believe that the result is obtained through the catalytic action of the colloidal gold on the excess formaldehyd. The formic acid so formed combines with the potassium carbonate liberated and, if sufficient in amount, will also repress the dissociation of potassium formate. Proof of this supposition seems to be furnished by three facts: 1. Many solutions made by the prescribed technic may be slightly alkaline immediately at the completion of reduction, but become neutral after the lapse of a few minutes without further treatment. 2. Solutions made with a known excess of alkali may be made neutral by reheating and adding additional formaldehyd. 3. Solutions which have been standing for some time and have become alkaline may be made neutral by heating and adding formaldehyd. These "corrected" solutions give typical curves with spinal fluids (Table 3).

Correction of Solution.—It is interesting to note that, while blue solutions made with insufficient formaldehyd may be corrected, and those alkaline from preparation with excess alkali or from standing may be neutralized, and that these may be satisfactorily used in testing spinal fluids, we have not been able to correct the turbidity due to marked excess of alkali or to irregular heating.

The fact that alkaline solutions may be made neutral simply by heating and adding formaldehyd may be used to advantage in the correction of the reaction (if this is desired), in that it requires no particular accuracy of manipulation or of quantity, as the formaldehyd may be added 1 c.c. at a time until the reaction becomes definitely neutral. It may be added that if evaporation of water is considerable, either during the preparation of the solution or in correcting its reaction, water may be added to restore the original volume.

Standards for Solutions.—The standards to which a solution must conform to be adjudged satisfactory have been stated by Miller and his associates to be as follows:

1. The solution must be absolutely transparent and preferably brilliant orange red or salmon red.

2. Five c.c. of the solution must be precipitated in one hour by 1.7 c.c. of a 1 per cent. sodium chlorid solution.

3. It must be neutral when used.

4. It must give a typical reaction with a known paretic fluid.

5. It must show no more than a change to red-blue with a known normal fluid.

4. Glaser: Neurol. Centralbl., 1914, **33**, 688, 748. Lee and Hinton: Am. Jour. Med. Sc., 1914, **148**, 33.
5. Landolt-Bornstein: Tabellen.

Our work leads us to conclude that: 1. Solutions which are transparent, but show a slight shimmer by reflected light, may be used satisfactorily. The curve will not differ from that given by a brilliant solution. 2. If a solution is protected, so as to make it even slightly refractory to precipitation by the amount of sodium chlorid mentioned, it should not be used. 3. Solutions made with 1 c.c. potassium carbonate—0.3 c.c. above the required amount and, consequently, markedly alkaline to alizarin — give curves practically identical with those given by normal solutions (Table 3). With the technic described above we have never obtained acid solutions. It is quite possible that the acid solutions obtained by Miller and his associates were those in which they found reduction not occurring with the specified amount of formaldehyd. This was probably due to the removal, by the oxalic acid used, of the alkali required for the reducing action of the formaldehyd. If then further formaldehyd was added, the addition of 1 or 2 drops of alkali, sufficient to bring the solution to an alkaline reaction, permitted reduction. Meanwhile the very considerable excess of formaldehyd which was used was catalytically oxidized to formic acid and the reaction made acid to

TABLE 3.—CURVES OBTAINED

With Known Paretic Fluid:	
1. Brilliant, neutral solution	5555521000
2. Neutral solution with decided shimmer	5555552100
3. Blue-red solution made with 0.1 c.c. HCHO	4445555555
4. No. 3, corrected by adding HCHO	5555555200
5. Solution made with 3 c.c. HCHO	5555552100
6. Alkaline solution made with 0.525 c.c. K_2CO_3	5555552100
7. Solution made with 0.5 c.c. K_2CO_3 and corrected	5555555200
8. Alkaline solution made with 1 c.c. K_2CO_3 and 0.5 c.c. HCHO	5555521000
9. No. 8, after standing three weeks—very alkaline to alizarin	1223210000
10. Lange's technic—reaction neutral—used fresh	5555531000
11. Lange's technic-alkaline from standing three weeks.	2434410009
With Known Syphilitic Fluid:	
12. No. 1	1232110000
13. No. 8	1233210000
14. No. 10	2334110000
15. No. 4	1232200000
16. Brilliant solution alkaline from standing two months—corrected by reheating and adding HCHO	1232110000

alizarin. 4. Solutions satisfactory in color and not protected should show typical curves with abnormal fluids and no change with normal fluids.

CONCLUSIONS

1. Singly distilled water may be stored satisfactorily in clean glass for many days.

2. Protected solutions are usually due to unclean glass.

3. Reagents may be used satisfactorily as stock solutions.

4. If technic is carefully followed, turbid solutions are due to slow or irregular heating and cannot be corrected.

5. Formaldehyd should be added at from 90 C. to boiling.

6. Solutions poor because of use of minimal amounts of alkali or formaldehyd may be corrected, the latter, so that they may be used clinically.

7. The use of oxalic acid is not necessary and is possibly occasionally responsible for failure of reduction.

8. The presence of carbon dioxid is of no consequence.

9. Solutions alkaline at the time of preparation or on standing may be made neutral by reheating and adding formaldehyd.

10. Solutions showing a slight shimmer may be used satisfactorily.

11. Solutions definitely alkaline at the time of preparation, if of good color, may be satisfactorily used. Those alkaline from standing give irregular curves.

II. THE CLINICAL APPLICATION OF THE COLLOIDAL GOLD TEST

R. B. MC BRIDE, M.D.

In view of the fact that the preparation of a satisfactory solution for the colloidal gold test has become a simple problem, and that the performance of the test is attended with few chances of error, it would add greatly to our diagnostic and prognostic ability if we were able to establish definite and certain behavior of the test under identical clinical conditions and circumstances. With the view of adding our data to those already accumulated, this report is made.

The cases coming under our observation will be classed as syphilitic and nonsyphilitic. Of the latter there are many, but the collection is heterogeneous and does not yet seem suitable for the basis of definite conclusions. Our experience with syphilitic diseases of the central nervous system embraces, to date, fifty-nine patients on whom 169 examinations of the spinal fluid were made. All of these gave definite clinical evidence of some central nervous system involvement. With this comparatively small number our results have shown a uniformity in some particulars that leads us to feel that they are worthy of presentation as a basis for further study.

Of the fifty-nine syphilitic cases, fifty-six gave a positive colloidal gold test. The three cases that were negative to this test were classed by our clinical findings as cerebrospinal syphilis, and gave, respectively, sixteen, twenty-one and sixty-two cells. All of these gave positive Wassermann tests of the blood, while the one showing sixteen cells gave also a positive Wassermann on the spinal fluid.

Thirty-six of the fifty-nine cases gave positive Wassermann tests on the spinal fluid. There was no parallel to be drawn here except that the paretic curve was more often associated with a positive Wassermann than was any other curve. Nineteen of the fifty-one patients whose blood was examined gave positive Wassermann tests of the blood. All of the fifty-nine cases showed a pleocytosis ranging from nine to 120 cells. There were no parallels to be drawn here, as one case of syphilitic meningitis gave 120 cells with a positive Wassermann test of the spinal fluid and a marked curve in the meningitic zone, while a case of incipient tabes gave 120 cells and the spinal fluid was otherwise negative. Later this case of tabes developed a curve in the meningitic zone with a cell count of thirty-six. Solomon and Southard[6] have already pointed out that the colloidal gold reaction indicates one sort of physicochemical situation in the cerebrospinal fluid; the lymphocytosis indicates another type of reaction on the part of the nervous system. The number of cells accompanying a paretic curve varied from twelve to sixty, while with the meningitic curve they varied from twelve to 120. Of all our cases twenty to thirty cells was the average.

A positive globulin test was found in all cases, while reduction of Fehling's solution was seldom noted.

As to the reliability of the colloidal gold test, we found that of five cases diagnosed clinically as paresis,

6. Solomon and Southard: Jour. Nerv. and Ment. Dis., 1917, 45, 230.

all gave curves in the paretic zone. However, among eleven tabetics, the paretic curve was present in three cases; six gave meningitic curves, and two were in the syphilitic zone. Thirty-nine cases of cerebrospinal syphilis gave three negative curves with the colloidal gold test, as noted above; twenty were in the meningitic zone, and fifteen were in the syphilitic, and one, in whom paresis could not be entirely excluded, gave a paretic curve.

We believe there is no such thing as a provocative colloidal gold reaction. While several fluids showing a negative Wassermann test became positive after treatment, no change was noted in the gold test.

Red blood cells—or blood plasma—appeared, at times, to cause disturbance in the final reading, but no definite conclusion can be drawn from our series. A case of cerebrospinal syphilis with a positive Wassermann test on the spinal fluid and a syphilitic curve gave later, when many red cells were present, a paretic curve. Two cases of cerebrospinal syphilis with negative Wassermann tests on the spinal fluid and syphilitic curves gave later, with red cells present, the same curve, the blood causing no evident change. A case of tabes with positive Wassermann test on the spinal fluid and paretic curve, with red cells present, gave complete precipitation in all tubes.

Vigorous intravenous and intraspinal treatment tends to bring all positive tests on the spinal fluid toward the negative. Our experience has been that the colloidal gold test is the last to become negative, and hence is the most reliable as a prognositc guide. It is also our experience that the colloidal gold test is the earliest reliable test to be found in the spinal fluid of syphilitic patients, being frequently earlier than the Wassermann reaction. Pleocytosis and increased globulin content are excluded since they are present in all inflammatory conditions of the meninges. We have been unable in any wise to prove, but feel justified in assuming, that a given spinal fluid passes successively, during the progress of sphyilitic involvement, from syphilitic to meningitic to paretic curves, and vice versa, during intensive treatment. That is to say, the condition producing the change in the state of the colloidal gold is the same in all zones and merely present to a greater or less degree. Further observation will probably prove or disprove this assumption. We have several cases that have, under treatment, receded from the meningitic to the syphilitic zone, and some of these have finally become entirely negative. A case of clinical tabes which gave a paretic curve, with a positive Wassermann test on the spinal fluid and twenty cells, gave, after treatment, a meningitic zone curve, a negative Wassermann, and thirty cells. Clinically there was much improvement.

We believe that in active syphilis of the central nervous system, a positive colloidal gold test is always accompanied by one or more other indications of involvement of the central nervous system. Pleocytosis and increased globulin are always associated, but there is no constancy of association of other tests. There are, unquestionably, cases in which the colloidal gold curve will persist after all other findings are negative. This occurs probably in those cases in which no intraspinal treatment has been given, but which have reached apparent cure with only systemic medication. In these cases we believe the curve has little or no prognostic value. The patient is probably cured. In those instances in which repeated tapping of the canal has been done, we have found that the curve, while persisting longer than other findings, becomes negative if the patient receives a clinical cure.

CONCLUSIONS

1. A colloidal gold reaction typical for syphilis is nearly constant in cases of syphilis of the central nervous system.

2. This reaction is more delicate than the Wassermann tests on the blood and spinal fluid and more reliable than pleocytosis and globulin content. Curves are, of course, given with other conditions than syphilis, but we believe the curves mentioned above to be specific.

3. The test is the most reliable of the various tests as a diagnostic aid, and is the best guide for prognosis during treatment, probably tending to become negative in a regular and constant order.

4. Known paretics always give a paretic curve; however, there is obtained occasionally a paretic curve in other phases of central nervous system syphilis.

5. There is no provocative colloidal gold test.

6. The presence of red blood cells—or plasma—in the spinal fluid often vitiates the result of the test.

VEGETABLE FOODS FOR THE DIABETIC*

RUTH A. WARDALL
IOWA CITY, IOWA

Even a slight experience in the planning of the diet for the diabetic readily convinces one that careful thought and work along this line are needed, and that time and effort spent in an attempt to enlarge the meager diet list of such patients will be fully justified. With the necessary elimination of practically all fruits and many vegetables, because of their carbohydrate content, the diet of the diabetic becomes very much restricted and monotonous and undesirably reduced in bulk. The withdrawal of fruits and vegetables from the diet is keenly felt, and the diabetic craves the variety that is furnished by this type of food.

The usual analysis of our ordinary food materials gives their percentage composition in terms of so-called protein, fat, carbohydrate, ash and water, and from such data lists of foods have been compiled for the use of the diabetic. A familiar arrangement is that in which fruits and vegetables are classified into 5, 10, 15 and 20 per cent. carbohydrate groups, and from such lists definite portions are daily assigned to the diabetic in accord with his tolerance. Table 1, from Joslin's "Treatment of Diabetes Mellitus," gives an illustration of such a classification.

The figures of percentage composition of foods are capable of definite interpretation from the chemical, but not from the physiologic point of view. The end-products of a chemical analysis are not necessarily a safe index to the end-products of the same materials when taken as food into the animal organism. This is a well known fact, but one needs to bear it in mind when considering the amount of carbohydrate, and especially in the case of diabetes, in which the carbohydrate of the diet is so important a factor in the treatment. According to chemical constitution, cellulose and the hemicelluloses are as truly carbohydrates

* From the Sheffield Scientific School, Yale University.

as the sugars and starch, and the hemicelluloses are easily hydrolyzed with acid to the same simple sugars that result from the digestion of complex sugars and starch. Agar-agar is characterized by the hemicellulose galactan, but utilization experiments have shown that agar-agar is not to any appreciable extent a source of available carbohydrate for man. Inulin has been suggested as a possible carbohydrate for the diabetic because it yields levulose on splitting and there is some indication that levulose can be better tolerated than glucose. The higher animals have no enzyme capable of splitting inulin, and therefore its conversion into levulose in the body is dependent on the acid of the gastric juice. Lewis[1] has shown that inulin is poorly utilized by man. Intestinal fermentation attends its use, and the value of inulin in the diet is questionable. Swartz[2] has given numerous other illustrations of the failure of man to utilize certain complex carbohydrates.

TABLE 1.—FOODS ARRANGED APPROXIMATELY ACCORDING TO PERCENTAGE OF CARBOHYDRATES

	5 per Cent.*	10 per Cent.*	15 per Cent.	20 per Cent.
Vegetables (fresh or canned)	Lettuce Cucumbers Spinach Asparagus Rhubarb Endive Marrow Sorrel Sauerkraut Beet greens Dandelion greens Swiss chard Celery Tomatoes Brussels sprouts Watercress Sea kale Okra Cauliflower Eggplant Cabbage Radishes Leeks String beans Broccoli	Pumpkin Turnip Kohlrabi Squash Beets Carrots Onions Mushrooms	Green peas Artichokes Parsnips Canned lima beans	Potatoes Shell beans Baked beans Green corn Boiled rice Boiled macaroni
Fruits	Ripe olives (20% fat) Grapefruit Lemons	Oranges Cranberries Strawberries Blackberries Gooseberries Peaches Pineapple Watermelon	Apples Pears Apricots Blueberries Cherries Currants Raspberries Huckleberries	Plums Bananas Prunes
Nuts	Butternuts Pignolias	Brazilnuts Black walnuts Hickorynuts Pecans Filberts	Almonds Walnuts (English) Beechnuts Pistachios Pine nuts	Peanuts 40 per Cent. Chestnuts
Misc.	Unsweetened and unspiced pickles, clams, oysters, scallops, liver, fish, roe			

* Reckon available carbohydrates in vegetables of 5 per cent. group as 3 per cent. of 10 per cent. group as 6 per cent.

Since the carbohydrate-free foods are limited in number, efforts have been made to remove or reduce the carbohydrate naturally occurring in some of our foods, thereby making them suitable for the diabetic diet. The "thrice-cooked vegetables" represent such an attempt. In preparing them the water is changed twice during the cooking process and thrown away, carrying along a certain amount of soluble material. To learn something of the condition of the food after this treatment, "thrice-cooked vegetables" were prepared and analyses made to determine the extent to which carbohydrate is removable by water extraction. As might have been suspected, it soon became evident that there is a variation in the effectiveness of the method depending on the vegetable used.

A preliminary series of experiments was planned to gain a rough idea of the relative amount and nature of the material that might be removed by water extraction. In order to facilitate the process, the solid vegetables were cut into small pieces or slices. The vegetable was well covered with cold water, heated to the boiling point, and cooked for several minutes. This first water extract was drained off, fresh cold water added, and another extract made in the same way. This process was repeated until an extract was obtained that contained no reducing substance. Each extract when drained off from the vegetable was concentrated and made up to a given volume, and then its reducing power was tested qualitatively with Benedict's solution. All of the reducing extracts were united, and a determination of the reducing substance in this total extract was made by Benedict's method for quantitative estimation of glucose. The reducing substance of the total extract was calculated as glucose. In many instances the color of the extract interfered with the quantitative test, and such extracts were therefore clarified and decolorized by the use of lead acetate, the excess of the latter being removed with hydrogen sulphid gas. The nature of the reducing substance was further tested with yeast to determine its fermentability. The residue of the vegetable, after all extractions were made, was finely ground and submitted to amylolytic digestion with saliva, and the salivary extract was tested for reducing substance. When the color did not interfere, tests for starch were made with iodin. All figures are calculated on the edible portion of the food.

Table 2 reveals the fact that at the end of the third extraction — which fairly represents the "thrice-cooked" vegetable—some of these materials were comparatively freed from reducing substance while others were not. The table also shows enough difference in the amount of reducing substance to suggest the wisdom of a choice among these illustrative vegetables in making up a diabetic diet. A dietitian recently remarked that diabetic patients do not tolerate cauliflower very well. This is not surprising in view of the fact that the cauliflower is not only comparatively rich in reducing substance, but is also slow to give this up by cooking, as evidenced by the number of extracts showing reduction. In all of these vegetables in which the extract reduces, it also ferments with yeast. No further attempt was made to identify the reducing substance. Most of these vegetables were evidently very poor in starch, for salivary digestion of the residues in very few cases resulted in an extract that showed any reducing substance. The common use of spinach in the diet of the diabetic is easily justified by the low carbohydrate content, by the ease of its extraction, and by its good color and appearance even after several extractions. Fortunately, spinach retains its flavor to an appreciable extent. Celery also deserves a place in the diet of the diabetic. The ordinary field mushrooms (*Agaricus campestris*) are unique among the foods examined. These seem suitable for use, without modification, in the most restricted diet, and may be prepared alone or in combination with other less tasty products for the sake of flavor. The value of the mushroom is in its flavor, for it is seen to have no extractable carbohydrate, and Mendel[3] has shown that its nitrogen does not occur as protein, but in an unavailable form. This variety of mushroom may be found in the fields in the proper season, and it is not very difficult to cul-

1. Lewis, H. B.: Value of Inulin as a Foodstuff, THE JOURNAL A. M. A., April 20, 1912, p. 1176.
2. Swartz, Mary D.: Nutrition Investigations on the Carbohydrates of Lichens, Algae and Related Substances, Yale University Press, 1911.
3. Mendel, L. B.: The Chemical Composition and Nutritive Value of Some Edible American Fungi, Am. Jour. Physiol., 1898, 1.

tivate. Mushrooms both fresh and dried are fairly common in many of our markets and are frequently obtained at a very reasonable price.

The findings in the foregoing experiments are only preliminary to further work. The analyses should be repeated so that the results will represent averages from many more tests, and a number of other foods should be examined. The results already obtained are suggestive, however, of helpful possibilities in the preparation of food for the diabetic.

Following the principle used in the extraction of the sugar beet in the commercial preparation of sugar, similar treatment of a few other vegetables has been tried in an effort either to render them free from available carbohydrate or materially to reduce the amount. In this series of experiments the vegetables were finely sliced, well covered with water at 60 C. (140 F.) and allowed to soak. At intervals of ten or fifteen minutes, the water having cooled to 45 or 40 C. (113 or 104 F.) was drained off, and fresh water at 60 C. added for the next extraction. This process was repeated until, on removal of a portion of the vegetable and thoroughly cooking it at the boiling temperature, an extract was obtained which gave no reduction test.

Table 3 gives the results of the boiling water extraction and of the extraction at 60 C. The possibilities in the latter method have not been fully tested as yet. The extraction at the lower temperature seems equally efficacious in the case of some vegetables, but it is not adapted to the preparation of cabbage, for example, and probably not to some others. The extraction at 60 C. has the advantage of impairing color and texture less than the repeated extractions with boiling water.

To the normal person, with his liberty of choice of food materials, these extracted vegetables are not unusually tempting; but to the diabetic, with his restricted range of selection, they do offer something of interest. One diabetic was so much pleased with carrots prepared by the 60 C. extraction that he has planted this vegetable in his garden to assure his supply. It is evident that vegetables could be so treated and preserved for subsequent use either by canning or drying. By the use of a current of air from an electric fan, the carrots extracted at 60 C. can be easily and thoroughly dried in three and a half hours. They retain their color perfectly when desiccated in this rapid manner, and after soaking and cooking show little variation from the fresh carrot when cooked.

As it was realized that sucrose and other disaccharids, as well as the hemicelluloses, would not be detected in the foregoing direct examination of these vegetables for reducing substances, a more detailed analysis of carrots was made comparing the results of the extractions at boiling temperature and at 60 C. in experiments in which the extracts and residues were tested for reduction both before and after hydrolysis.

TABLE 2.—RESULTS OF BOILING WATER EXTRACTION

Vegetable	Artichoke (French)	Asparagus (canned)	Carrot	Cauliflower	Celery	Endive	Kale	Mushroom	Rhubarb	Spinach (fresh)	Spinach (canned)
Number of extracts showing reduction test	2	9	6	16	3	11	6	0	5	4	9
Percentage of reducing substance extracted and calculated as glucose	Trace	1.5	1.8	1.8	0.1	0.6	1+	0	0.4	0.2	0.4
Fermentation of extract with yeast	+ Very slight	+	+	+	+	+	+	0	+ Very slight	+	+
Percentage of reducing substance in salivary extract of residue	0	0	0	0.1	0	0	0	0	0	0	0
Iodin test for starch in extracts	.....	.....	0	+	0	0	....	0			
Total percentage of carbohydrate—average composition*	.....	2.8	9.3	4.7	3.3	....	....	6.8	3.6	3.2	

* Atwater and Bryant: Chemical Composition of American Food Materials, Bull. 28, Office of Experiment Stations, U. S. Department of Agriculture.

It is apparent that the carbohydrate of the carrot occurs almost entirely in the form of a soluble reducing substance, for neither salivary digestion nor hydrolysis adds materially to the total reducing power. This is not the result that occurs with the beet, for instance, for the carbohydrate of the beet occurs largely in the form of sucrose, and only a trace of reducing substance is found until after hydrolysis.

TABLE 3.—EFFECT OF TEMPERATURE ON EXTRACTION

Vegetable	Beet	Cabbage	Carrot	Eggplant	Parsnip	Pineapple
BOILING EXTRACTION						
Number of extracts showing reduction test	2	8	6	7	6	9
Percentage of reducing substance extracted and calculated as glucose	Trace	2.5	1.8	2.1	8.6	3.2
Fermentation of extract with yeast	+	+	+	+	+	
Percentage of reducing substance in salivary extract of residue	.....	Trace	0	0	0.4	
Iodin test for starch — Fresh vegetable	0	.....	Trace	0	+	0
Iodin test for starch — Cooked vegetable	0	.....	Trace	0	+	0
Iodin test for starch — Extract	.....	.....	0	0	+	0
SIXTY C. EXTRACTION						
Time required to free from reducing substance	1 hour	? Little affected	1½ hrs.	2 hrs.	1 hour	3½ hrs.

An attempt was made to extract carrots with cold water. The finely sliced vegetable was put into a heavy bag, which was fastened to the tap, and water at full pressure was forced through the bag for twenty hours; but this plan of diffusion with cold water removed only a very small amount of the reducing substance of the carrot.

These tests are preliminary to more extended work along the same and similar lines. Other foods may well be modified by these methods, and other methods of modification may suggest themselves for trial.

CONCLUSIONS

Repeated water extraction as employed in the "thrice-washed" or "thrice-cooked" vegetables is more effective in removing carbohydrates from some foods than from others.

The effectiveness of the extraction at 60 C. in the case of the beet and carrot suggests the possible advantage of using the lower temperature in the preparation of other foods.

TABLE 4.—COMPARISON OF RESULTS OF EXTRACTIONS AT BOILING TEMPERATURE AND AT 60 C.

	Reducing Substance per Hundred Gm. Carrots	
	100 C. Extraction	60 C. Extraction
Total extract:		
Reducing substance before hydrolysis.....	1.5 gm.	1.2 gm.
Reducing substance after hydrolysis.....	1.9 gm.	1.6 gm.
Residue:		
Reducing substance after hydrolysis.....	0.5 gm.	0.7 gm.
Reducing substance after salivary digestion	Trace	0.14 gm.

If the soluble carbohydrate is in an available form, the repeated extractions are justified, provided that the resulting product is still reasonably palatable. If, however, the carbohydrate is not available, as in the case of mushrooms, the process is useless.

Information concerning the nature and physiologic significance of the carbohydrate will lead to a rational method of procedure in the preparation of the foods.

PROLAPSUS UTERI AND ITS TREATMENT *

A. J. RONGY, M.D.
Fellow of the American College of Surgeons
NEW YORK

It is not the purpose of this short paper to bring forth a new method for the treatment of uterine prolapse, nor is it my intention to enter into a detailed discussion of the technic of the various operations now in vogue. I feel that much has been said and written on the subject. To me it seems that the entire subject of pelvic hernia has in the past been viewed from the standpoint of repair only. The inventive powers of the gynecologist have been heretofore directed toward the development of a newer and better technic for the construction and their replacement of tissues and organs in the proper places. True, this resulted in the development of one of the most ideal operations, and one which may be performed in the case of the largest percentage of patients suffering from uterine prolapse, namely, "the vaginal fixation or interposition operation."

This operation, if well performed in properly selected cases, completely cures the patient. No other single or combined surgical procedure accomplishes such desirable results. It is surprising to note that many gynecologists, however, still resort to other means to correct this condition, the most troublesome to which middle-aged women are subject. Is it because the interposition operation presents a more difficult technic? Or is it because a great number of gynecologists are better trained in the older methods and refuse to progress?

It seems to me that in the light of our present knowledge there should not be a difference of opinion as to the indications and contraindications for this operation. However, while it is true that we have perfected a good surgical technic for the cure of pelvic hernia, yet it appears to me that no attempt has been made by either the gynecologist or the obstetrician to seek deeply into the causes which bring about the various degrees of hernia of the vaginal vault, resulting from childbirth. Poor obstetrics is usually the reason assigned in a large percentage of cases. Now, is this true? It has been my good fortune to be associated with large obstetric services since the days of my early training. I had unusual opportunities to observe both normal and abnormal obstetrics as it is practiced in hospitals. I also had the advantage of examining and carefully watching a large number of patients in my office during their antepartum period. I tried to correlate the size and consistency of the fetal head, the nature of the labor; whether short, spontaneous or instrumental, with the findings after a careful examination — six or eight weeks postpartum. I was soon convinced that the history of the labor, and the size of the child, very often did not coincide with the postpartum findings. Some of the most severe forms of procidentia were discovered in patients who had very easy deliveries. Again, very often few local disturbances were discovered, even after the most difficult instrumental delivery.

It seems to me that the causes for prolapse of the pelvic viscera is still not thoroughly established. Studies of the anatomy of the pelvic floor in cases of prolapse do not disclose all the etiologic factors. They simply reveal an existing condition as a result of trauma. The anatomist, during his studies, is not familiar with the obstetric history of the patient. He is unable to judge what were the mechanical factors concerned in the production of these anatomic distortions. I believe that if it were possible for the anatomist to observe the mechanical processes of a given case of labor and then study the structures of the pelvic outlet, he would reach a more definite conclusion as to the reasons why normal labor will very often cause prolapse of the pelvic viscera. To illustrate, let me quote from one of the most illuminating articles on the subject of repair of the pelvic outlet, by Haynes. He says:

> The lesions considered in this paper are produced at childbirth by the passage of the child through the parturient canal, either unassisted or aided by the use of forceps.
>
> Probably the premature application of the forceps or their faulty adjustment or ignorant use, contributes to the production of tears of the pelvic outlet. Indeed it is probable that the rarer form of rupture of the levator ani muscle close to the pelvic arch is due solely to the cutting action of the blade of the badly applied or used forceps.
>
> At birth, then, the child must pass through the pubococcygeal loop of the levator muscle, through the gap in the perineal shelf, and through the vaginal slit in the pubococcygeal hammock. . . .
>
> This passage is usually made without any material damage when the normal conditions affecting mother, child and time prevail by the gradual stretching of the structures composing the different layers. However, there may be such a disparity between the size of the child and the potential passageway or the birth so precipitate, that all the structures are torn through into the rectum or into the ischiorectal fossa. Between these two extremes there are all grades of lacerations.

We all agree as to the truth of these statements when generally applied, but the description, while

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

comprehensive, fails to include a very essential element of the etiology of this condition, namely, a competent and complete obstetric history of the patient.

Personal observations have led me to believe that the three factors which are concerned with the production of visceral and pelvic prolapse are:

1. The construction of the bony outlet.
2. The general muscular development of the patient, especially as regards the muscles of the pelvic outlet.
3. The size of the child, particularly in cases which are overdue.

It is an established clinical fact that lacerations of the posterior pelvic segment, even when left unrepaired, do not produce prolapse of the pelvic organs. However, lacerations of the structures of the anterior portion of the pelvis will as a rule result in the prolapse of the bladder and uterus.

A study of the anatomy of the bony outlet very soon discloses the reason why, in some patients, the posterior segment is damaged, while in others the lacerations will take place in the anterior segment. The studies of Klien of the measurements of the pelvic outlet prove conclusively that the various dimensions of the bony outlet have a definite bearing on the course of labor. The relationship in the size of the anterior sagittal and the posterior sagittal line to the transverse diameter of the outlet will decide whether the head will be born at the expense of the anterior segment or of the posterior segment of the outlet. If for some reason the posterior sagittal line is contracted, the head will have to be born at the expense of the anterior segment of the bony outlet. Here the fetal head encounters the soft parts of the anterior portion of the pelvic outlet, and if the strain is too great they give way and the support of the bladder and uterus is practically removed. If, however, the anterior sagittal line is shortened and the head has to be born at the expense of the posterior pelvic segment, lacerations of the perineum will take place. A rectocele will ensue; but the actual supports of the bladder and uterus have not been interfered with.

The development of the bony pelvis is entirely neglected in the present scheme of practical medicine. The young growing girl is not given the proper care she deserves. To prepare womanhood for future motherhood requires more than passing attention. As

TABLE 1.—AGE OF PATIENTS OPERATED ON

Age, Years	Number of Cases
Below 30	8
Between 30 and 40	28
Between 40 and 50	35
Between 50 and 60	21
Over 60	8
Total	100

obstetricians we must anticipate all possible defects in the development of these girls and correct them if possible.

As to the muscular development and tone, it is plain that the two intracranial glands, hypophysis and epiphysis, normally exercise a remarkable influence on the nutrition and skeletal growth. A perversion or dysfunction of one or more of the internal secretions very often may be observed at a time when proper treatment will correct it. The reason for its neglect is the ignorance of the mother. If the mothers were taught that any disturbance of metabolism in the young girl, or any apparent sexual disorder, requires attention, she would seek proper medical aid. We must ignore the conventional barriers in the treatment of the unmarried woman, as we do in the unmarried man. To modern social conditions must also be attributed an undoubted pernicious influence on childbirth. The forcing of a great number of young women to enter the industrial field early in life where they are compelled to engage in sedentary occupations prevents their physical development. This has created a large percentage of women who are unable to deliver themselves spontaneously.

The size and consistency of the fetal head surely plays an important part in the causation of pelvic

TABLE 2.—RELATIVE PARITY OF PATIENTS

Parity of Patients	Number of Patients
Primiparas	5
Secundiparas	13
Tertiparas	10
Quadriparas	12
Quintiparas	6
Sextiparas	7
Septiparas	7
Octiparas	1
Noniparas	4
Deciparas	6
Undeciparas	2
Duodecipara	1
Tredeciparas	3
Quatriuordeciparas	1
Septendeciparas	1

lacerations and relaxations. In this instance I feel that the obstetrician is entirely to be blamed. We have no right to allow a primipara to be overdue an unreasonable time. The child grows unusually large, and the cranial bones become hard and do not mold readily. These patients are exposed to the danger of dystocia when labor sets in. It can be obviated by a timely induction of labor.

Once hernia of the pelvic outlet occurs, the problem is, What means have we at our command to correct it? Many operations have been devised; none, however, answered the purpose until the interposition operation had been perfected. This operation is of comparatively recent adoption in this country. It is only a short time that the combined abdominal vaginal operations have been performed in all of these cases. The results were poor because the anatomy of the anterior vaginal wall and that of the bladder were not taken into consideration. Usually the cystocele recurred in a very short time, and the patient felt that she was subjected to a useless operation.

We must, however, realize that the technic of this operation varies with each case. The condition of the cervix, the extent of the cystocele and the size of the body of the uterus will tend to modify the various steps in the operation. To my mind, the most important single step in this operation in any given case is to decide the exact point of fixation of the anterior wall of the uterus to the roof of the vagina. Should the uterus be fixed too high, we may have undue pressure symptoms of the neck of the bladder; and if fixed too low, the patient will always have a bearing down sensation in the vagina. For the purpose of this study I collected 100 instances in which the interposition operation was performed. Ninety of these are from the gynecologic service of Lebanon Hospital, and ten from the Jewish Maternity Hospital. I included in this series only those patients that were admitted to the hospital with the diagnosis of prolapsus uteri. Patients who suffered from lesser degrees of prolapse of the pelvic viscera, and on whom this operation has been performed, are not included in this series. I feel that in those cases other methods could possibly have been substituted.

During the childbearing period it is important that these patients should be sterilized. This is accomplished by resection of the tubes from the horns of the uterus and the stitching of the cut ends into the sides of the uterus at a point slightly lower than the original tubal opening. A few of our earlier patients were not sterilized, and in some pregnancy ensued. In all these patients labor was very complicated. The dystocia was primarily due to the high situation of the sluggishly dilating cervix in the bony pelvis. The altered axis of the uterine cavity caused the presenting part to rest against the promontory of the sacrum. The force of the uterine contractions pushed the fetal part beyond the axis of the inlet and thus prevented the part from engaging itself in the true pelvis.

A number of patients aborted before the end of the third month, as the uterus was firmly adherent anteriorly and could not rise above the brim.

Table 1 gives a statistical report of the patients operated on. The average age of the patients was 43.9 years. The youngest patient was 25 years old, the oldest 68.

The number of children the patients had was stated in eighty-three cases (Table 2).

Four were never pregnant.

The date of the birth of the last child is stated in fifty-four cases in Table 3.

The menstrual history was normal and regular in seventy-one cases.

In twenty-nine cases, menopause occurred. Relief for this condition was sought soon after the patient noticed something protruding from the vagina. Seven of these patients were operated on previously for the relief of the procidentia with little or no benefit. Forty-nine patients were treated by vaginal pessaries for a period of from two to twenty years.

In a number of patients, other pathologic conditions of the uterus and adnexa were encountered. On one patient, salpingo-oophorectomy was performed. In two cases, cystic ovaries were removed. In one

TABLE 3.—TIME BETWEEN THE BIRTH OF THE LAST CHILD AND THE PERFORMANCE OF THE INTERPOSITION OPERATION

Birth of Last Child	Number of Cases
Six months after	6
One year	3
Two years	5
Three years	5
Four years	6
Five years	5
Six years	1
Seven years	2
Eight years	3
Nine years	1
Ten years	1
Eleven years	2
Thirteen years	1
Sixteen years	2
Seventeen years	3
Twenty years	2
Twenty-one years	2
Twenty-three years	1
Twenty-nine years	2
Thirty-one years	1

case, resection of the ovary was performed. In one case, a right diseased tube was removed. In three cases, small uterine fibroids were enucleated from the uterine wall. In one case, a uterus bicornis was found.

POSTOPERATIVE COMPLICATIONS

It is interesting to note what little postoperative reaction took place in this series of cases. Most of them were fairly comfortable on the second or third day after the operation. The pain they usually suffered was that of a perineal wound. Only seven patients had marked postoperative temperature of 103 or more. Three patients had a temperature of between 102 and 103. The remaining patients had a slight rise or normal temperature. Three patients developed edema of the vulva, which cleared up at the end of a week.

Ten days after the operation one patient developed pyelitis of the right kidney, which cleared up before she left the hospital.

One patient developed temporary insanity one week after the operation. Her condition improved when she was discharged from the hospital.

TABLE 4.—EXTENT TO WHICH CATHETERIZATION WAS EMPLOYED

Number of Cases	Number of Days
In 14	1
In 12	2
In 5	3
In 9	4
In 8	5
In 2	6
In 6	7
In 5	9
In 5	10
In 5	11
In 1	12
In 2	14
In 1	16

One patient developed a pelvic abscess. The pus was evacuated by an abdominal incision. A vesicovaginal fistula developed which was closed about six weeks later.

Most of these patients have to be catheterized because of the inability of the bladder wall to contract on account of the extensive denudation and separation of the bladder from the vaginal wall and the anterior uterine surface. However, fourteen of these patients voided spontaneously.

The average period of time these patients were confined to bed was eighteen days. The average stay in the hospital was twenty-five days.

Finally, it is my firm belief that with the improvement in the practice of obstetrics, hernia of the pelvic viscera will be greatly diminished. Relative disproportion between the fetal head and the pelvis causing tedious and protracted labor must necessarily either stretch or lacerate the soft parts of the pelvis which eventually produces a prolapse of the uterus and the bladder. It is the duty of the obstetrician to recognize this condition sufficiently early so as to prevent its occurrence.

Furthermore, I feel that a great deal can be accomplished by carefully watching the development of the young girl; and as soon as disturbances, either of a constitutional or a local nature, are noticed, treatment must be promptly instituted, for only in that way can she be prepared for future motherhood.

62 West Eighty-Ninth Street.

ABSTRACT OF DISCUSSION

DR. FRANK L. NEWTON, Boston: We see many of these patients neglected, and the young women not being prepared to bear children. Pregnancy is not essential to prolapsus. One case coming under my observation is typical of many. The young woman came to our city from a neighboring state. The physician sending her said she needed hysterectomy. There was a virgin girl with prolapsed uterus who had been treated year after year with tampons and other measures. I had her examined by Dr. Fitts. When he was through I asked if he saw any necessity for doing hysterectomy. "Hysterectomy!" he said. "Why there is prolapse of the uterus, and prolapse of the stomach as well. If you take

out one, why not the other?" This case illustrates, I think, the fact that the obstetric condition is not a necessary cause of prolapse. In another case, that of an older woman, married but never pregnant, there had been prolapse for years; absolutly complete procidentia, with all the parts intact. In the treatment of prolapsus uteri we must meet the conditions. If we find a large, eroded cervix in a woman who has borne a number of children, I would amputate it thoroughly, believing that here we have a field for carcinoma. The presence of a fibroid might be an indication for hysterectomy, but do not remove the ovaries and tubes even if operation is performed through the vagina. Do your pelvic plastic work yourself; such work needs an artist. Rather let your assistant carry out the abdominal procedure.

DR. JACOB A. RUBEN, Pittsburgh: Until a method gives us 100 per cent. permanent cures in prolapsus uteri, the last word has not been said on its treatment. Preparing a woman to be a mother is an enormous field in itself, which I will not touch on. I only want to call attention to the big factors underlying the causes of prolapse. It occurs primarily under two fundamental conditions: (1) the destruction or weakening of the muscular support of the pelvis; (2) the displacement of the uterus from pointing backward toward the hollow of the sacrum. In a woman who has borne two or more children, the muscles of the urogenital diaphragm are reduced to connective tissue. The levator ani alone forms the pelvic diaphragm. If in such a woman the levator muscle is torn through, we have the primary condition favoring prolapse. Physiologically and anatomically speaking, the key to all prolapse operations must be the construction of a high, muscular perineum and the replacing of the uterus and bladder in their normal positions.

DR. HARRY ARANOW, New York: In a study of 4,000 or 5,000 cases I have been convinced that while a tear of the perineum may be a cause of prolapsus in some cases, in the majority of instances it is not. In a complete laceration of the perineum there is rarely a prolapse. It is the woman with a long, narrow chest and a thin abdominal wall who is likely to have prolapsus whether she has had a bad tear or not.

I have had the good fortune to have the care, in subsequent confinements, of two interposition cases in which operation was performed by Dührssen in this city. There were no complications. Of course I would not advise anybody to perform an interposition operation in a young woman. I simply mention the two cases which came under my care as house surgeon. Dr. Dührssen closed up the peritoneum very carefully and brought the uterus forward as we used to do in ventral suspension.

The operation of interposition is a very complicated procedure, with many factors to be considered. I had one case in which the woman was between 70 and 80 years of age, with complete prolapsus. The cervix was suspicious in appearance, the uterus exceedingly small. The patient was sent to me for an interposition operation. I said it was impossible. Instead I performed a Mayo vaginopelvic fixation operation, bringing the two round ligaments across, making a bridge for the bladder, and the woman made an uneventful recovery. Again, in a case of this sort, with a large heavy uterus, one cannot perform an interposition operation; nor in a very young woman who has not had children and who is anxious to have them. Interposition without sterilization is rather dangerous.

DR. HARVEY P. JACK, Hornell, N. Y.: Perhaps some day we may know more about the internal secretions and be able to administer the particular one needed. Speaking practically, however, we are faced with a young woman of from 20 to 25—several of whom I have had—with complete prolapsus. Are you going to subject that woman to hysterectomy with the consequent nervous conditions? Are you going to do an interposition operation with all its dangers? No. Amputate the cervix, shorten the round ligaments and allow that woman to go on. You have not and cannot cure her. You have given her a chance that she may develop and bear babies and be a regular woman. It is not right to allow the teaching to go out that the interposition operation ought ever to be considered. Some men may be able to do it, but when they succeed they beg the question; they do a suspension. We have no right to condemn these young women to difficult labors or the inability to have children. We must deal with the practical things until we know more of that which is not now understood. Therefore, I think this section should condemn absolutely the interposition operation. You can cure the prolapsus without it and leave the woman with a function.

DR. ABRAHAM J. RONGY, New York: To my mind there are two causes for prolapsus—indirect and direct. I believe that the young girl, as soon as she reaches puberty, ought to be obliged to see whether she is developing properly. I believe the question of the internal secretions will solve the matter in the near future, and that we shall be able to influence growth and development. Regarding the interposition operation, in a young woman of 25 or 26 who has had one or two children and is anxious to have more, I never advise operation. I try, rather, some form of pessary to help her, and advise that after she is through having babies such operation might be considered. In a woman who has had two or three children and who is not anxious to have more, the interposition operation comes into play and there is no operation that does the work so well. I firmly believe that intra-abdominal pressure has very little influence on prolapsus; it acts as a secondary factor when things are once relaxed and out of place. Dr. Spalding of San Francisco said that in a number of cases in the second stage of labor when the labor became tedious he separated the perineum down to the rectum in order to shorten the labor. In these cases when the head has been born at the expense of the anterior segment, I think it will be the ideal plan to separate the posterior pelvic segment and the perineum in order to allow the head to come down to the posterior part of the pelvis and not stretch the supports of the uterus.

THE INTRAVENOUS PHLORIZIN TEST*

MARTIN KROTOSZYNER, M.D.
AND
WILLIAM E. STEVENS, M.D.
SAN FRANCISCO

Phlorizin is a glucosid which was discovered by de Koninck in 1855. It is derived from the root-barks of various fruit trees, which, when brought to boiling in acid mediums, give off a glucose called phlorose, and a glycogen, the so-called phloretin.[1] Phlorizin occurs in minute and slightly pinkish crystals, and is sparingly soluble in cold water, alcohol and ether, but freely soluble in hot water from which solution it crystallizes out on cooling.[2] In 1885, von Mehring[3] found that phlorizin produces glycosuria in man. Ten years later the first statement in regard to the renal origin of phlorizin glycosuria was made by Zuntz,[4] who, after introducing cannulas into the ureters of a dog, exposed one kidney, into the renal artery of which phlorizin was injected, with the result that sugar appeared first and in greater amount from the ureter of the injected kidney. That phlorizin diabetes undoubtedly originates in the kidney was, later on, proved by Pavy, Brodie and Sian's[5] experiment. After removal of all abdominal viscera except the kidneys of a dog, phlorizin was injected, with the result that no increase in the quantity of blood sugar

* Read before the Section on Genito-Urinary Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Kapsammer: Nierendiagnostik und Nierenchirurgie, **1**, 87.
2. New and Nonofficial Remedies, THE JOURNAL A. M. A., July 3, 1909, p. 33.
3. Von Mehring: Centralbl. f. d. med. Wissensch., 1885.
4. Zuntz: Arch. f. Anat. u. Physiol., 1895.
5. Pavy, Brody and Sian: On the Mechanism of Phlorizin Glycosuria, Jour. Physiol., 1903.

ensued, while the urine contained a large amount of sugar.

Less convincing as regards exact proofs were experimental investigations aiming at localization of sugar formation in the kidney. Seelig,[6] after transforming glucose in the kidney into phenylglucosazone, studied onset and extension of sugar formation microscopically, and from the appearance of large numbers of glucosazone needles at and around the collective tubules, he concluded that sugar excretion occurred almost entirely by means of these channels. Nussbaum,[7] who had found that the glomeruli of the frog kidney were exclusively supplied by the renal artery, concluded, from the absence of sugar in the urine after ligation of that vessel, that sugar formation occurred solely in the glomeruli. Nussbaum's findings, though, were refuted by the investigations of Adami[8] and later on by those of Beddard,[9] who discovered anastomoses between the renal artery and vein in the frog kidney, while the observations of Hellin and Spiro[10] on phlorizin sugar excretion in rabbits with experimental nephritis pointed to the epithelial cells as the principal seat of renal sugar formation. Thus the problem of exact localization of renal glycosuria, which would have cleared up many points of apparent incongruity in the application of the phlorizin test, is still awaiting its final solution.

In 1896, G. Klempêrer,[11] who was the first to use phlorizin on renal lesions in man, reported absence of glycosuria in chronic nephritis after giving large doses of phlorizin internally. This method of administration was soon afterward branded as inefficacious by Magnus Levy,[12] who pointed out that phlorizin, by these means, reached the kidneys in an already broken form, and who, after hypodermic injection of the drug, observed glycosuria in various forms of pathologic kidney conditions. In 1899 Achard and Delamare,[13] on the basis of fundamental experimental investigations, stated that reduction or total absence of phlorizin glycosuria was characteristic of kidney diseases complicated by definite loss of renal parenchyma. On these facts Casper and Richter[14] based their application of the test in the form of hypodermic or intramuscular administration of the drug in conjunction with ureteral catheterization. In this way they were able to study the action of the drug separately on either kidney, and to utilize the test as a comparative index of functional renal capacity in unilateral kidney lesions. According to their statement, the phlorizin test measures the quantity of functionating renal parenchyma and, by these means, that of renal capacity, the percentage of excreted sugar corresponding to the amount of functionating parenchyma of the kidney. When these statements failed to be entirely corroborated by personal observations of various authors, and particularly after Israel's[15] demonstration of kidneys that had been found barren of phlorizin glycosuria, though possessing functionating parenchyma, Casper and Richter[14] modified their views, stating that absence of phlorizin glycosuria was significant of an advanced degree of renal incapacity,

TABLE 1.—RESULTS OF BLADDER TEST BY MEANS OF INTRAVENOUS INJECTIONS OF 2 C.C. OF 0.5 PER CENT. PHLORIZIN IN NORMAL CASES

Number	Sex*	Age	Diagnosis	Appearance Minutes	Fifteen-Minute Periods			Remarks
					First	Second	Third	
1	♂	26	Chronic prostatitis	12.5	0.72	0.36	0.04	
2	♂	52	Pelvic osteosarcoma	9	0.54	0.15	0.0	Qualitative determination with Fehling's solution
3	♀	62	Carcinoma vesicae	6.5	0.9	0.4	0.0	
4	♂	28	Bilateral inguinal hernia	8	1.11	1.7	0.31	
5	♂	40	Sexual neurasthenia	6	0.7	0.28	0.21	
6	♂	33	Sec. syphilis	10	0.6	0.2	0.0	Quantitative determination with Lohnstein's saccharimeter
7	♂	32	Sexual neurasthenia	6	1.4	0.4	0.0	
8	♂	27	Sexual neurasthenia	4.5	2.2	1.6	0.25	
9	♂	42	Chronic prostatitis	6	0.64	2.8	0.2	
10	♀	24	Chronic pelvic gonorrhea	8	3.75	2.66	0.62	
Average				7.65	1.25	1.05	0.16	

* In this column ♂ denotes male and ♀ female.

TABLE 2.—RESULTS OF BLADDER TEST BY MEANS OF INTRAVENOUS INJECTIONS OF 2 C.C. OF 0.5 PER CENT. PHLORIZIN IN PATHOLOGIC CASES

Number	Sex	Age	Diagnosis	Appearance Minutes	Fifteen-Minute Periods			Remarks
					First	Second	Third	
1	♂	62	Prostatic hypertrophy	26	0.3	0.06	0.05	
2	♂	77	Rightsided calculous pyonephrosis	7.5	1.6	0.6	0.0	No reduction with Fehling's after 29 minutes
3	♂	35	Rightsided renal tuberculosis	25	0.1	1.6	0.3	
4	♂	69	Prostatic hypertrophy; complete retention	11	1.6	0.3	0.14	No reduction after 2 hours
5	♂	73	Prostatic hypertrophy; chronic myocarditis	8.5	1.7 1.6	0.94 0.01	0.4 0.0	Reduction ceased after 50 minutes Reduction ceased after 80 minutes
6	♂	68	Carcinoma of prostate	10				
7	♂	76	Carcinoma of prostate	30	0.1	0.1	0.0	Reduction ceased after 40 minutes
8	♂	70	Carcinoma of prostate	20	0.7	0.3	0.0	
9	♂	60	Prostatic hypertrophy; chronic nephritis	15	0.3	0.0	0.0	No reduction after 55 minutes
10	♂	63	Cancer of bladder; leftsided pyelonephritis	11	0.1	0.0	0.0	No reduction after 60 minutes
Average				16.4	0.81	0.391	0.089	

6. Seelig: Deutsch. med. Wchnschr., 1900.
7. Nussbaum: Arch. f. Anat. u. Physiol., 1906.
8. Adami: Jour. Physiol., 1885, **6.**
9. Beddard: Jour. Physiol., 1902, **28.**
10. Hellin and Spiro: Arch. f. exper. Path. u. Pharmakol., 1897, **38.**
11. Klemperer, G.: Verhandl. d. Ver. f. inn.. Med. zu Berlin, 1896.
12. Levy, Magnus: Verhandl. d. Ver. f. inn. Med. zu Berlin, 1896.
13. Achard and Delamare: Soc. de Biol., 1899, **21,** 1.
14. Casper and Richter: Funktionelle Nierendiagnostik., Berlin-Wien, 1901.
15. Israel: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1903.

while its quantity was directly proportional to that of the functionating parenchyma of the kidney.

For the application of the test, the following technic was finally adopted: As soon as both ureters are catheterized, 2 c.c. of a 0.5 per cent. phlorizin solution (0.01 gm. of the drug) are injected hypodermically, one thigh being preferably selected as the site of injection. Only fresh solutions, never more than two weeks old, are used, and thorough dissolving of phlorizin crystals is effected by placing the phlorizin container in a water bath from which it is removed the moment the boiling point is reached. The phlorizin solution is then drawn directly from its container into the syringe and at once injected. The appearance of sugar, which normally occurs about fifteen to twenty minutes, and not later than thirty minutes after phlorizin injection, is ascertained by means of test tubes containing small amounts of heated Fehling's solution, and urine portions for quantitative sugar determination are collected during the next fifteen to thirty minutes, during which period phlorizin sugar excretion is known to be at its climax. Thus, the whole test can, in most instances, be finished in about an hour.

Inaccurate dosage, resulting from loss of water, or precipitation of crystals on cooling of the phlorizin solution, is obviated by strict adherence to these technical details, which must be carried out under trained supervision. Quantitative sugar determination is afterward done by means of Lohnstein's saccharimeter, for which only 0.5 c.c., or about 8 minims, of urine suffice; in order to insure accuracy of comparative results, three saccharimeters, two for both renal urines and the third for distilled water as control, are employed.

The literature contains either insufficient or no data concerning the technic of phlorizin application, of which we can find only brief mention in Kapsammer's[16] book. Omission of a description of technical details in textbooks and publications on the subject is, according to our experience,[17] probably responsible for the often reported failures in obtaining glycosuria, whereas we in our extensive practical work with the test have had no difficulty in that direction.

The test was soon recognized as one of our most important means for estimating relative kidney function. Israel,[18] who always maintained a skeptical attitude toward the real value of functional kidney tests, designated the test as a welcome addition to our diagnostic armamentarium, and Albarran[19] concedes to the method real usefulness. Barth[20] considers the test particularly important for the diagnosis of difficult cases, and Kapsammer[21] claims for the phlorizin test first rank among renal functional methods. Greene and Brooks[22] designate the test the most practical of functional methods, a view from which they have not departed in the latest edition of their textbook. Our own results with the test were most gratifying, and careful comparison with the results from other functional tests, especially from phenolsulphonephthalein, brought forth this statement:[23] The phlorizin, phenolsulphonephthalein and urea tests show in normal cases almost identical values for both kidneys, and exhibit in pathologic cases a striking parallelism of diminished functional values. As compared with the phlorizin method, the phenolsulphonephthalein test is subject to fewer technical errors and is less time-consuming, while the possibility of exact quantitative estimation of excreted sugar renders the

TABLE 3.—RESULTS OF RENAL TEST IN NORMAL CASES: COMPARATIVE VALUES OF PHLORIZIN

No.	Sex	Age	Diagnosis	Fifteen-Minute Periods						Remarks
				First		Second		Third		
				R.	L.	R.	L.	R.	L.	
1	♀	28	Chronic urethritis and trigonitis	1.06	1.22	0.2	0.3	0.00	0.00	No reduction with Fehling's after 37 min.
2	♂	40	Chronic prostatitis	4.0	3.0	3.6	1.2	0.2	0.0	No reduction after 35 minutes
3	♀	42	Functional polyuria	0.2	0.2	0.0	0.0	0.0	0.0	No reduction after 35 minutes
4	♀	30	Chronic prostatitis	2.0	2.0	1.0	1.0	0.12	0.12	Trace figured as 0.1
5	♂	45	Chronic prostatitis	1.52	1.68	Trace	Trace	0.0	0.0	
6	♀	35	Chronic pelvic peritonitis	1.56	1.4	Trace	0.3	0.0	0.0	
7	♂	30	Sexual neurasthenia	1.36	1.38	0.64	0.98	0.0	0.15	No reduction after 75 minutes
8	♂	38	Chronic prostatitis	4.8	4.0	0.2	0.2	0.01	0.01	
9	♂	35	Chronic prostatitis	1.25	1.0	0.25	0.2	0.0	0.0	
10	♂	40	Balanoposthitis	1.7	2.0	1.24	1.56	0.92	1.14	No reduction after 70 minutes
Average				1.95	1.79	0.73	0.6	0.12	0.14	

TABLE 4.—RESULTS OF RENAL TEST IN PATHOLOGIC CASES: COMPARATIVE VALUES OF PHLORIZIN

No.	Sex	Age	Diagnosis	Fifteen-Minute Periods						Remarks
				First		Second		Third		
				R.	L.	R.	L.	R.	L.	
1	♂	56	Bilateral nephrolithiasis	0.18	0.12	0.0	0.0	0.0	0.0	No reduction with Fehling's after 37 min.
2	♂	30	Rightsided hydronephrosis	0.9	1.1	0.5	0.3	0.01	0.0	No reduction after 40 minutes
3	♀	28	Bilateral hydronephrosis	0.8	0.56	0.02	0.03	0.18	0.01	No reduction after 45 minutes
4	♀	43	Bilateral pyelonephritis	0.66	0.52	0.2	0.04	0.0	0.0	No reduction after 78 minutes
5	♂	46	Rightsided hydronephrosis	0.35	1.9	Trace	Trace	0.0	0.0	Trace counted as 0.01
6	♂	30	Rightsided calculous pyonephrosis	0.3	1.7	0.0	1.15	0.0	0.88	
7	♀	36	Rightsided pyohydronephrosis	0.1	0.8	0.0	0.6	0.0	0.5	
8	♀	46	Bilateral hydronephrosis	0.59	0.56	0.3	0.2	0.35	0.28	Microscopically: Many pus cells on right side; only a few pus cells on left side
9	♂	32	Rightsided pyelonephritis	0.42	0.62	0.28	0.35	0.1	0.2	
10	♂	26	Leftsided nephritis	0.52	0.48	0.2	0.06	0.1	0.05	
Average				0.48	0.83	0.15	0.27	0.07	0.19	

16. Kapsammer: Nierendiagnostik und Nierenchirurgie, **1**, 92.
17. Krotoszyner: Am. Jour. Dermat., **11**, 9.
18. Israel: Berl. klin. Wchnschr., 1902.
19. Albarran: Exploration des fonctions rénales, Paris, Masson, 1905.
20. Barth: Arch. f. klin. Chir., 1903, **71**.
21. Kapsammer: Nierendiagnostik und Nierenchirurgie, **1**, 100.
22. Greene and Brooks: Diseases of the Genito-Urinary Organs, Philadelphia and London, 1917, p. 85.
23. W. E. Stevens: The Comparative Value of Modern Functional Kidney Tests, THE JOURNAL A. M. A., May 16, 1914, p. 1544.

phlorizin test much more reliable than the phenolsulphonephthalein test.

THE INTRAVENOUS TEST

Thus, the cumbersome technic and the length of time required for its performance appeared to be the most important objectionable features tending toward sidetracking or even eliminating the hypodermic phlorizin test in favor of the more commodious and expeditious phenolsulphonephthalein method. Success in meeting the first drawback depended obviously on the possibility of bringing the glucosid to the cystoscopic room in a vehicle in which it could be kept indefinitely in solution without, by precipitation of phlorizin crystals, losing its efficacy, and at the same time insuring the uniformity of results which generally attends the employment of phenolsulphonephthalein. For these purposes we experimented, at first, with ampules, similar to the familiar type in use for the phenolsulphonephthalein test, and containing the required amount of phlorizin in a nonprecipitating, 0.25 per cent. solution, as recently suggested by Greene.[24] However, by extensive experimentation, including comparative tests with fresh phlorizin solutions, it was found that ampule efficacy became vitiated in the course of time, four months constituting the limit, after which it was either considerably lessened or entirely extinct. While, therefore, not recommending ampule administration for general use, as involving the risk of inaccuracy, we would, nevertheless, suggest the exclusive use of this most commodious method of phlorizin application for large urologic clinics in which routine renewal of ampules could easily take place every month. For the average urologist, however, we advise the use of tablets, which we finally succeeded in devising, and which were made for us after the following formula: phlorizin, 0.01 gm., and sodium chlorid sufficient to make 0.03 gm.

Phlorizin injection by means of these tablets is a simple and expeditious procedure. The tablet is placed in the barrel of an all-glass Lüer syringe, into which, after adjustment of the needle, 2 c.c. of hot distilled water are drawn up, and injection is made as soon as, by shaking, thorough dissolving of the tablet has been effected.

TABLE 5.—COMPARATIVE RESULTS OF PHLORIZIN, PHENOLSULPHONEPHTHALEIN AND UREA IN NORMAL CASES

No.	Sex	Age	Diagnosis	Phlorizin				Phenolsulphonephthalein				Urea		Remarks
				Appearance		Amount %		Appearance		Amount %				
				R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	
1	♀	32	Urinary frequency; trigonitis	6	6	1.48	1.48	10	7	4	3	0.009	0.011	Quantitative phenolsulphonephthalein determinations made with Heil ge colorimeter. Comparative urea determination made with Doremus ureometer
2	♂	28	Chronic prostatitis	7	6.5	1.56	1.36	2.5	2.5	13	14	0.015	0 016	
3	♀	35	Urinary frequency; trigonitis	6.5	6.5	1	1	4	4	25	15	0.004	0.001	
4	♀	40	Cystitis; vaginal catarrh	5	5	0.4	0.4	3	3	4	4	0.003	0.003	
5	♀	24	Chronic pelvic gonorrhea	4	4	0.3	0.3	3	3	12	15	0.001	0.001	
6	♂	38	Chronic prostatitis	5	5	0.5	0.54	5	5	12	5.5	0.015	0 014	
7	♂	29	Sexual neurasthenia	9	9	1.56	1.66	6	7	11.5	11.0	0 0026	0.0032	
8	♀	34	Caruncle at meatus	5.5	6	0.5	0 36	3	3	10	8	0.0052	0 0056	
9	♂	36	Chronic prostatitis	5	5.5	0.72	0 52	4	4	4	6	0.016	0 015	
10	♀	26	Urinary frequency; chronic urethritis	5	4.5	0.6	0 4	4	4	18	25	0.007	0.012	
Average				5.8	5.8	0.86	0.8	4.45	4.25	11.35	10.65	0.075	0.08	

TABLE 6.—COMPARATIVE RESULTS OF PHLORIZIN, PHENOLSULPHONEPHTHALEIN AND UREA IN PATHOLOGIC CASES

No.	Sex	Age	Diagnosis	Phlorizin				Phenolsulphonephthalein				Urea		Remarks
				Appearance		Amount %		Appearance		Amount %				
				R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	
1	♂	30	Rightsided renal neoplasm	7	6	0.08	Trace	4	3.5	Trace	Trace	0.004	0.0012	Trace of phlorizin, figured as 0.01; trace of phenolsulphonephthalein, figured as 0.01; trace of urea, figured as 0.001
2	♀	50	Bilateral pyelonephritis	6.5	6	0.8	0.56	6	7	2	9.5	0.002	0.004	
3	♂	27	Rightsided hydronephrosis	8	14	0.3	1.7	7	7.5	4	6	0.001	0.0024	
4	♀	33	Leftsided pyelonephritis	5	5	1.74	0.86	4.5	5	12.5	4	0.028	0.015	
5	♂	46	Rightsided hydronephrosis	14	5	0.6	0.2	5.5	3.5	4.5	5.5	0.012	0.01	
6	♂	27	Leftsided renal tuberculosis	5	4.5	0.58	0.0	7	7	2.6	0.04	0.02	0.009	
7	♀	30	Leftsided pyonephrosis	5	20	1 0	Trace	3.5	25	18	Trace	0.02	Trace	
8	♂	24	Rightsided renal tuberculosis	7	8.5	0.37	2.4	4	4.5	Trace	17	0.013	0.022	
9	♂	56	Bilateral nephrolithiasis	13.5	6.0	0.18	0.12	4.5	4	3	6	0.006	0.008	
10	♀	35	Rightsided pyonephrosis	10.5	8	1.3	3.5	3	3	7.5	8	0.005	0.012	
Average				8.1	8.3	0.69	0.93	4.9	4.7	5.4	5.6	0.011	0.0117	

Elimination of loss of time, which would remove the second obstacle to the general acceptance of the phlorizin test, appeared the more imperative, since intravenous administration of phenolsulphonephthalein had of late become established as a rapid and safe comparative functional method. It was only natural that we attempted to attain this end by the same intravenous route.

It was obviously from the start incumbent on us to establish the safety and innocuousness of this mode of phlorizin administration. In the literature we could find only one reference disclosing untoward results of large intravenous doses, that of Leschke,[25] who observed experimentally in rabbits grave clinical symptoms (spasms, paralysis of heart and respiration). The same author's statement that, after intra-

24. Greene: New York Med. Jour., August, 1915.

25. Leschke: Arch. f. d. ges. Physiol. (Pflüger's), 1910, **132**, 319.

venous administration of large doses of phlorizin, an integral part of the drug was traceable in the blood of nephrectomized animals, was refuted by Glaesner and Pick,[26] who, on the basis of their repeated experimental work, insisted that no trace of enormous phlorizin quantities, up to 3.0 gm., could be found in the blood of nephrectomized animals. Neither did Biedl and Kolisch[27] nor Herszky[28] observe symptoms of kidney irritation or disagreeable by-effects and after-effects consecutive to large doses of phlorizin. For clinical purposes Albarran[19] first advocated the use of comparatively large phlorizin doses (0.02 gm.), which, later on, Casper and others[29] recommended for cases in which ordinary doses failed to produce reactive glycosuria.

Since, therefore, small doses, which we administered in the beginning of our work, were productive only of sugar values of such minute quantities as to be practically valueless for purposes of comparative estimation, we did not hesitate to increase the dose cautiously until, by numerous tests on healthy and diseased individuals, we ascertained the fact to our full satisfaction that intravenous phlorizin administration in doses sufficiently large to insure satisfactory duration and intensity of sugar reaction was absolutely harmless and not attended by untoward sequelae. The dose of 0.01 gm. phlorizin, contained in our tablets, was found to be entirely sufficient for ordinary purposes, and even injection of the double dose, which was repeatedly made in cases in which no glycosuria was obtained after the ordinary dose, was never followed by untoward by-effects and after-effects.

Several hundred normal and pathologic cases were tested in this way in order to obtain reliable data on average time of appearance, acme of excretion, and disappearance of intravenous phlorizin glycosuria.

After laborious compilation of our cases we finally decided to utilize for tabulation case groups of equal numbers and representing, wherever feasible, different observations of the same type. By these means we were able to obtain particularly gratifying results for purposes of group comparison.

BLADDER TEST

The bladder test for determination of total renal permeability by means of intravenous phlorizin injection is performed in the following manner: The bladder is emptied by introduction of a catheter which is left in situ, and 1 cg. of phlorizin is injected into one of the arm veins. Testing for sugar is begun at once by letting a few drops of urine flow into test tubes containing a few cubic centimeters of heated Fehling's solution, until typical sugar reaction occurs. The average results of the test under normal and pathologic conditions may be gleaned from Tables 1 and 2.

In cases with normal renal permeability sugar appeared in about seven minutes and in cases with pathologic or reduced renal capacity not earlier than fifteen minutes. In both types of cases, sugar excretion was at its acme during the first fifteen minute period, was markedly reduced during the second, and was very low or had disappeared during the third period.

TABLE 7.—RESULTS OF RENAL TEST IN NORMAL CASES: COMPARISON OF PARALLEL VALUES ON BOTH SIDES FOR PHLORIZIN, PHENOLSULPHONEPHTHALEIN AND UREA

No.	Sex	Age	Diagnosis	Phlorizin		Phenolsulphonephthalein		Urea		Phlorizin Values Compared	Phenolsulphonephthalein Values Compared	Urea Values Compared	Remarks
				R.	L.	R.	L.	R.	L.				
1	♀	30	Urethral caruncle	0.4	0.47	4	4	0.003	0.003	1.0 : 1.2	1.0 : 1.4	1.0 : 1.0	
2	♀	24	Chronic pelvic peritonitis	0.3	0.3	12	15	0.001	0.001	1.0 : 1.0	1.0 : 1.25	1.0 : 1.0	
3	♂	27	Chronic prostatitis	1.24	0.9	12	Trace	0.014	0.014	1.0 : 1.5	1.2 : 1.0	1.0 : 1.0	Trace of phenolsulphonephthalein counted as 0.1
4	♂	26	Sexual neurasthenia	0.5	0.54	12	5.5	0.015	0.014	1.0 : 1.01	2.3 : 1.0	1.07: 1.0	
5	♂	32	Chronic prostatitis	2.0	2.0	12	12	0.016	0.017	1.0 : 1.0	1.0 : 1.0	1.0 : 1.06	
6	♀	30	Enteroptosis	1.16	1.4	None	3	0.007	0.009	1.5 : 1.2	1.0 : 3.0	1.0 : 1.3	
7	♂	33	Chronic prostatitis	1.3	1.2	15	15	0.016	0.015	1.1 : 1.0	1.0 : 1.0	1.07: 1.0	
8	♂	46	Sexual neurasthenia	0.4	0.35	18	18	0.001	0.001	1.1 : 1.0	1.0 : 1.0	1.0 : 1.0	
9	♀	35	Urethritis and trigonitis	0.84	0.84	17	14	0.056	0.06	1.0 : 1.0	1.2 : 1.0	1.0 : 1.07	
10	♀	40	Urethral caruncle and hemorrhoids	1.48	1.48	4	3	0.0095	0.011	1.0 : 1.0	1 33: 1.0	1.0 : 1.16	
Average				1.02	1.091	2.27	1.22	1.014	1.059				

TABLE 8.—COMPARATIVE PHLORIZIN AND PHENOLSULPHONEPHTHALEIN WITH REFERENCE TO QUANTITY OF RENAL URINES IN NORMAL CASES

No.	Sex	Age	Diagnosis	Phlorizin			Phenolsulphonephthalein					Quantity of Renal Urines Compared	Remarks
				Per Cent.		Values Compared	Quantity		Per Cent.		Values Compared		
				R.	L.		R.	L.	R.	L.			
1	♀	48	Urethral caruncle	3.4	2.5	1.0 : 0.7	40	20	12	6	2.0 : 1.0	2.0 : 1.0	Ureter catheters of equal caliber were employed
2	♀	40	Vaginal catarrh; trigonitis	1.0	1.0	1.0 : 1.0	20	10	25	15	1.7 : 1.0	2.0 : 1.0	
3	♂	29	Chronic prostatitis	4.0	3.0	1.3 : 1.0	7	3.5	9	5	1.8 : 1.0	2.0 : 1.0	
4	♀	36	Chronic urethritis and trigonitis	0.84	0.84	1.0 : 1.0	28	20	17	14	1.2 : 1.0	1.4 : 1.0	
5	♀	42	Vaginal catarrh; trigonitis	0.2	0.2	1.0 : 1.0	13	11	7	6	1.2 : 1.0	1.2 : 1.0	Phenolsulphonephthalein tests done after phlorizin
6	♂	35	Phosphaturia	4.5	3.5	1.3 : 1.0	12	12	14	16	1.0 : 1.1	1.0 : 1.0	
7	♂	45	Chronic prostatitis	4.8	4	1.2 : 1.0	7	10	4	6	1.0 : 1.5	1.0 : 1.4	
8	♂	24	Sexual neurasthenia	1.18	1.08	1.1 : 1.0	12	18	2.5	6	1.0 : 2.4	1.0 : 1.5	
9	♂	40	Balanoposthitis	0.92	1.14	1.0 : 1.2	8	7	10.5	9.5	1.1 : 1.0	1.1 : 1.0	
10	♂	46	Sexual neurasthenia	1.65	1.7	1.0 : 1.03	10	9	13	13	1.0 : 1.0	1.1 : 1.0	
Average				2.2	1.8	1.09: 0.99	15.7	12.0	11.4	9.6	1.2 : 1.0	1.38: 1.09	

26. Glaesner and Pick: Arch. f. d. ges. Physiol., 1910, **133**, 82; **135**, 176.
27. Biedl and Kolisch: Eighteenth Congress f. inn. Med., Wiesbaden, 1900.
28. Herszky: Med. Blaetter, 1902.
29. Salomon: Berl. klin. Wchnschr., 1909, No. 51.

Our extensive work with the bladder test, which we intend to continue in the future, disclosed in many instances such inconclusive and even contradictory results as to be useless for tabulation. Many problems concerning significance of delayed appearance or entire absence of glycosuria, and relation of percentage to absolute quantity of sugar excretion, are still waiting for their solution. More conclusive evidence is particularly needed with regard to phlorizin as compared with phenolsulphonephthalein estimation. We therefore wish to limit the discussion at this time to a few facts which in the course of our investigations appeared to be fairly well settled.

In normal cases, sugar reaction generally ceased forty-five minutes after its appearance. In pathologic cases, sugar was traceable for considerably longer periods, extending to more or less than an hour, and in a few instances even to two hours. Delayed appearance, which never exceeded seventy-five minutes, did not seem to run parallel to length of sugar reaction. In a few pathologic cases the acme of excretion occurred at a later period than in the normal. In quite a number of cases of arteriosclerosis, contracted kidney, and cancer of the prostate, no sugar reaction occurred, and in only a few of them could delayed and faint sugar reaction be obtained on injection of the double dose of phlorizin. In a few of these cases, in which absence of phlorizin glycosuria persisted, initially poor values of cryoscopy and blood urea gradually approached more normal points coincident with improvement of clinical symptoms. Simultaneous phenolsulphonephthalein tests performed in this type of cases always showed delayed appearance and low, but definitely determinable, phenolsulphonephthalein values. While, on repeated testing, phlorizin sugar appearance and quantity showed such a bizarre and irregular curve as to be void of prognostic significance, phenolsulphonephthalein appearance and output, on the other hand, in the same cases assumed the characteristic curve of rising values coincident with improvement of clinical symptoms.

Equally unsatisfactory at our hands was the result of the numerously performed estimations of the total amount of phlorizin glycosuria and of the comparative determination of percentage and absolute quantity of excreted sugar, and, like Casper,[30] we do not attach to these procedures any practical value. We also agree with Blum and Prigl,[31] in refusing to accept unreservedly Kapsammer's statement that normally prompt appearance of phlorizin glycosuria is an absolute proof of normal renal capacity. But we fully endorse Greene's[32] recent statement that delayed appearance of phlorizin sugar rarely occurs in healthy individuals, and we consider persistently delayed onset of phlorizin glycosuria indicative of impairment of renal function.

In a few cases of hematuria in old prostatitics in whom the phenolsulphonephthalein test was impracticable, prompt phlorizin sugar appearance furnished a most welcome prognostic aid for operative indications. In a large number of this type of cases, on the other hand, persistent absence of glycosuria rendered the test useless.

To sum up, in the bladder test the time method of sugar appearance is of value, while quantitative methods are useless. The bladder phlorizin test is not a successful rival to the well-defined, quantitative bladder phenolsulphonephthalein test.

THE RENAL TEST

The technic of the intravenous phlorizin test for determination of comparative renal permeability is identical with that of the bladder test. As soon as bilateral ureteral catheterization is performed, phlorizin is injected and the appearance of sugar is noted on both sides. It was found that intravenous phlorizin glycosuria, when urine is collected directly from the kidneys, appeared normally about five minutes after injection. Quantitative comparative sugar determinations are then made by means of Lohnstein's saccharimeters in the previously described manner.

TABLE 9.—COMPARATIVE PHLORIZIN AND PHENOLSULPHONEPHTHALEIN WITH REFERENCE TO QUANTITY OF RENAL URINES IN PATHOLOGIC CASES

No.	Sex	Age	Diagnosis	Phlorizin			Phenolsulphonephthalein					Remarks
				Per Cent.		Values Compared	Quantity		Per Cent.		Values Compared	
				R.	L.		R.	L.	R.	L.		
1	♀	28	Bilateral pyelonephritis	0.8	0.56	1 : 0.7	1.5	6.5	2	9	1 : 4.5	1.0 : 4.3	
2	♂	30	Rightsided renal tuberculosis	0.37	2.4	1 : 6.5	10	39	Trace	17	0.1 : 1.7	1.0 : 3.9	Trace of phenolsulphonephthalein counted as 0.1
3	♀	27	Rightsided hydronephrosis	0.3	1.7	1 : 5.5	14	8	4	6	1 : 1.5	1.75: 1.0	
4	♂	30	Rightsided renal neoplasm	0.03	1.47	1 : 5	3.5	13	Trace	13	0.1 : 1.3	1.0 : 3.7	
5	♂	56	Bilateral nephrolithiasis	0.18	0.12	1.5 : 1	16	7.5	3.5	8	1 : 2	2.1 : 1.0	
6	♀	33	Rightsided pyonephrosis	1.8	2.5	1 : 3	16	3.5	7.5	8	1 : 1	4.7 : 1.0	
7	♂	46	Rightsided hydronephrosis	0.35	1.9	1 : 5	14	7	14	6	2.3 : 1	2.0 : 1.0	
8	♂	30	Rightsided pyelonephritis	0.9	1.1	1 : 1.2	6	2	12	4	3.0 : 1	3.0 : 1.0	
9	♂	25	Rightsided ureter stone	1.2	0.88	1.5 : 1	26	39	10	14	1 : 1.5	1.0 : 1.5	
10	♂	30	Rightsided hydronephrosis	0.26	2.0	1 : 5.5	3.5	10	Trace	9	0.1 : 9	1.0 : 2.9	
Average				0.58	1.56	1.1 : 3.4	11.0	12.6	5.4	9.4	1.6 : 5.1	1.8 : 2.0	

Tables 3 and 4 show graphically the average acme, decrease and disappearance of sugar excretion in the comparative test.

Average figures for normal cases show a striking parallelism of comparative appearance and percentage in all three tests, with differences so insignificant as to be negligible.

In the group of pathologic cases, the average of phlorizin appearance was considerably delayed on both sides, while figures for sugar percentage on both sides were somewhat smaller than those found in normal cases. Phenolsulphonephthalein, on the other hand, appeared in pathologic cases about equally as early as in normal cases, while the difference of phenolsulphonephthalein quantity amounted to almost half of that found in normal cases. The average bilateral urea values were considerably reduced as compared with those of normal cases. Averaging of values on the pathologic against those on the normal

30. Casper: Handbuch d. Cystoskopie, 1911, p. 328.
31. Blum and Prigl: Wien. klin. Wchnschr., **21**, 22.
32. Greene: Hospital Bull. of the Dept. of Publ. Char. of New York, January, 1917.

side for phlorizin and phenolsulphonephthalein gives a ratio of about 1:4, showing also for pathologic cases a fair parallelism of these tests.

Table 7 was prepared in order to ascertain which of the three tests produced the most uniform comparative figures, establishing it, by these means, as the most accurate and thus the most reliable index of relative kidney function.

In normal as well as in pathologic cases, sugar excretion was at its acme during the first fifteen minute period, was markedly reduced during the second period, and was very low or had entirely disappeared during the third period. Sugar reaction in renal urines had, as a rule, disappeared after forty-five minutes in normal and pathologic cases, and persisted to an hour or longer (seventy-eight minutes in one instance) in only a few observations of the latter type. Since the acme of intravenous phlorizin glycosuria is reached almost immediately after its appearance, and since, for comparative quantitative sugar determination with Lohnstein's saccharimeters, very small urine quantities (less than 1 c.c.) suffice, the time required for the performance of the test is, under favorable conditions, shorter than in any other functional method based on injection of a foreign substance.

For the purpose of comparing the intravenous phlorizin with other well established functional tests, the two most popular methods for comparative estimation of renal function, the phenolsulphonephthalein and urea tests, were chosen. The results of these investigations appear in Tables 5 and 6.

The ratio for comparative values of urea, phlorizin and phenolsulphonephthalein in normal cases was 104:107:187. Thus urea, an end-product of metabolism, naturally excreted by the kidneys, showed almost equal values on both sides (100:104), phlorizin, a foreign substance injected for measuring renal function, running a close second (100:107), while phenolsulphonephthalein, a dye used in the same fashion as phlorizin, showed marked discrepancy of parallelism (100:187).

The most important reason for this phenomenon is, without doubt, the unequal amount of urine which both kidneys under normal conditions may, and as every experienced cystoscopist knows, actually do secrete during the same period of time. Leaking of urine alongside the ureter catheter, temporary plugging of its lumen by mucus or a blood clot, and the often occurring unilateral reflectory auria or polyuria are additional factors in causing quantitative differences in renal urines, collected during certain time periods, as necessary for quantitative phenolsulphonephthalein determination. For the comparative phlorizin test, on the other hand, only determination of the amount of sugar excretion at a certain period of phlorizin glycosuria is needed, since it is well known that both healthy kidneys excrete simultaneously about the same amount of sugar. Tables 8 and 9 serve to illustrate this point.

In normal cases the average ratio for comparative phlorizin and phenolsulphonephthalein values was 100:110, and 100:120, respectively, while the average ratio for quantities of renal urines was 100:150. In pathologic cases the ratio for comparative phlorizin and phenolsulphonephthalein values was 100:300 and 100:170, respectively, this striking incongruity apparently being due to differences in renal urine quantities, the average of which showed a ratio of 100:270.

The wide discrepancy of the ratio of renal urine quantities between normal and pathologic cases is most decidedly due to the more frequent occurrence of reflectory unilateral polyuria in the pathologic cases, which, according to Albarran, is observed only rarely in persons with healthy kidneys.

In cases of advanced unilateral pyonephrosis (stone, tuberculous, etc.), when occasionally only a few drops can be collected from the diseased side, and in unilateral hematuria, the intravenous phlorizin test always furnished us with the desired information as regards comparative renal function, which not infrequently was either missing or unsatisfactory with other methods. In renal urines we have not observed absence of phlorizin glycosuria, which, as previously mentioned, so often occurred in application of the test on bladder urines.

The ideal aim of functional renal diagnosis tends toward determination of the absolute and largest amount of work which each kidney is able to perform. Since this ideal is not practically available at present, we must be content with methods that, like the phlorizin test, are able to demonstrate the comparative working capacity of each kidney. We hope that the improvement of the test by intravenous administration will serve to secure for it its well earned place among recognized functional methods for determination of comparative renal function. Functional kidney diagnosis is still in its infancy, and can be advanced only by critical consideration of the relative value of the various functional methods, and only in this way will survival of the fittest for practical purposes eventually result.

CONCLUSIONS

1. The intravenous phlorizin test, with our simplified technic, is a commodious and expeditious procedure.

2. In normal cases, sugar appears within seven minutes in bladder urine, and within five minutes in renal urines. The acme of sugar excretion sets in within a few minutes, and its disappearance occurs within forty-five minutes after phlorizin injection.

3. As a test for total renal permeability (bladder test) its usefulness is limited. The prompt appearance of sugar generally indicates normal function, and persistently delayed appearance is characteristic of impaired renal function. Quantitative determination of total sugar excretion is useless.

4. As a test for comparative renal function, the intravenous phlorizin test gives more accurate, and thus more reliable, results, while its technic is as simple and less time consuming than that of the phenolsulphonephthalein test.

999 Sutter Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. THOMAS AND BIRDSALL, AND KROTOSZYNER AND STEVENS

DR. ROBERT H. GREENE, New York: Any investigations I have carried on as regards the permeability of the kidney have been from the standpoint of the surgeon, and I have endeavored rather to keep away from the work of the physiologic chemist. I have not felt qualified for it, and I have desired to try to find things which were easy to do, and which would give me some idea as to the condition of my patient in a very short time, and whether or not the work of a physiologic chemist should be brought into any particular case.

Several years ago I tried in the wards at the hospital cryoscopy, methylene blue and phlorizin in connection with ure-

teral catheterization, and I found that the phlorizin test was the most practical. Later, when phenolsulphonephthalein came to the front, in a comparative series of cases, some of which were medical and some surgical, I tried to find out in a rather rough and ready way which was the most accurate, phenolsulphonephthalein, phlorizin, or the estimation of the nitrogen in the urine compared with the nitrogen in the blood. I also have carried on some little studies on indigocarmin. Indigocarmin, in my experience, is a useful test in connection with ureter catheterization, but it is not as useful in a rough and ready way because it is not elastic enough. The series of cases in which I tried phlorizin, the estimation of the nitrogen in the blood compared with the nitrogen in the urine, and the phenolsulphonephthalein test showed a marked resemblance in the results obtained. The ratio of difference between the three methods was very slight indeed. The most accurate was the estimation of the nitrogen in the blood compared with the nitrogen in the urine; but, of course, this last is work that has to be carried on by a physiologic chemist. The phlorizin test was second and the phenolsulphonephthalein third.

DR. B. S. BARRINGER, New York: We all have certain reasons for certain tests. At Bellevue we use three tests, the phlorizin, the percentage urea, and the indigocarmin, for three different reasons. We believe that phlorizin—and that comes first in our estimation—gives a good quantitative estimation, an absolute ratio of what both kidneys are doing. We use the percentage urea test only in comparing the output of the two kidneys, because it gives some sort of a vague index of the relative power of each kidney to concentrate urea. We use the indigocarmin test because it is an easy test to use with the cystoscope, and we can make a diagnosis at times without ureter catheterization, simply by means of the cystoscope in the bladder.

I think when all has been said and done that we cannot depend on the functional tests alone. For instance, if we are going to perform a prostatectomy and we find the phenolsulphonephthalein is low and the blood nitrogen high, we are cautious about operating; but it does not necessarily mean that we do not operate.

DR. ABRAHAM HYMAN, New York: We have employed most of these tests as a routine, and have practically come down to the use of indigocarmin, phenolsulphonephthalein, and the examination of the blood for urea and nitrogen retention. The phenolsulphonephthalein test we do not use in conjunction with ureteral catheterization; a two to three hour bladder specimen is examined so as to obtain an indication of the total output of both kidneys. Indigocarmin combined with ureteral catheterization has been found the most practical, simple and reliable of all the functional tests. Whereas all these tests are of value, and more so if three or four of them are applied, too much stress should not be placed on the results; patients with negative tests should not always be refused operation. During the past few years a few patients with no indigocarmin and phenolsulphonephthalein output, and a number with very slight function, have been successfully operated on for serious renal and prostatic disease. All such operations should be performed under nitrous oxid and oxygen anesthesia. Ether will often turn the balance in the wrong direction.

DR. WILLIAM F. BRAASCH, Rochester, Minn.: It is a difficult matter to place any definite comparative value on the phlorizin, the indigocarmin and the phenolsulphonephthalein tests. As far as phlorizin is concerned, my experience has been with the old method of subcutaneous injection, and I think Rowntree and Geraghty have shown the fallacy of these tests. The method of Dr. Krotoszyner is entirely different. It sounds very promising, and I mean to try it out thoroughly.

There is no doubt that, as a routine procedure, phenolsulphonephthalein is more accurate as an aid to differential diagnosis than indigocarmin. But I believe that indigocarmin, when injected intravenously, has its value. Not infrequently I find it valuable to employ both indigocarmin and phenolsulphonephthalein simultaneously. This would seem impossible because of the difficulty of making colorimeter tests, but the difficulty was obviated by Dr. Anders Peterson, who suggested a method by which the blue color could be removed. He found that by simply adding sodium hydroxid the blue color disappears and the colorimeter test for phenolsulphonephthalein may be continued.

DR. ANTON G. RYTINA, Baltimore: I have had very little or no experience with phlorizin, a fair amount of experience with indigocarmin and quite an extensive experience with phenolsulphonephthalein. There is no question whatever that indigocarmin has a place, but for comparative values I feel that it does not compare with phenolsulphonephthalein.

DR. HERMAN L. KRETSCHMER, Chicago: Some years ago when the phenolsulphonephthalein test was first introduced we ran a small series of cases, comparing the phenolsulphonephthalein, the indigocarmin, and the phlorizin tests. At that time we were not estimating the output of indigocarmin; we merely took the time of appearance of the blue dye and the time of appearance of the sugar. Our results were rather uniform as regards time of appearance, all three tests running quite uniform; that is, where there was a delay in time of appearance, the delay was the same for all three tests.

Because of the ease with which one could read the phenolsulphonephthalein figures, we have since then been adhering to the phenolsulphonephthalein in our work.

One of the speakers called attention to the fact that the phenolsulphonephthalein figures occasionally might be very low. I think it was Keyes a few years ago who called attention to the fact that the presence of the ureteral catheters caused a disturbance of the renal function, so that the phenolsulphonephthalein may be low and the function good. In all cases in which the phenolsulphonephthalein figures are very low (I recall one or two instances in which the output from the side which was to remain was only 2 per cent.) I make a second test later, getting the whole bladder urine.

DR. GEORGE W. STARK, Syracuse, N. Y.: For about two years I have been using a combined functional test which I believe gives us a better insight as to the reserve power of the kidney than any other test mentioned. It is also a vascular and tubular test—the introduction of water into the circulation together with the phenolsulphonephthalein test. It is not necessarily new.

This test is based on the fact that the viscosity of the blood is absolutely constant, the urine being the varying factor. The normal figures are based on thirty normal cases. The patient is given no water for two hours previous to the test; then a pint of Saratoga Vichy is given. A catheter is left in the bladder and the urine collected for fifteen minutes. The normal case runs 20 c.c.; specific gravity about 1.024. In about half an hour after this extra water is thrown into the circulation all the reserve power of the kidney is brought into play. Under this forced excretion, normally in the third quarter there is excreted about four times the amount that we had in the first quarter. This corresponds to our experimental work on kidneys (that is, one can remove three fourths of the kidney substance and have an animal live). This hypersecretion continues for about an hour and then gradually decreases. Corresponding to this increased secretion is a lowering of the specific gravity to about 1.004 or 1.005. In other words, this shows the ability of the kidney to dilute and concentrate, and is a vascular test. In nephritis, the first quarter is somewhat less, usually under 20 c.c., while in the third quarter there may be increased elimination under forced water drinking, and very little change in the specific gravity, depending on the amount of kidney substance destroyed. Thus, if we get an elimination of 15 c.c. in the first quarter, and an elimination of 30 c.c. with but a slight change in the specific gravity, we assume that about 50 per cent. of the kidney substance is gone.

This test in conjunction with the phenolsulphonephthalein test, I believe, will give a better insight as to the extent of the injury to both the glomeruli and the tubular system of the kidney, and also as to the reserve power of the kidney.

DR. JOHN T. GERAGHTY, Baltimore: In our work with functional tests it has been our purpose, not so much to duplicate the tests that give us the same information, but to try to employ tests that give us information that we will not get from any one test. For that reason we test the excretory power of the kidney, which we do best with phenolsulphone-

phthalein. Indigocarmin and all these substances practically run parallel. It is simply a question of which can be read the best. They are all excreted by the same mechanism of the kidney. But we want to know, besides the excretory capacity of the kidney, any retention which may be present. It is perfectly possible for a kidney to have very markedly decreased excretion and at the same time to be able to excrete the substances that are necessary; so we make a test for retention. We select for this purpose the urea. Urea, creatinin and total nitrogen run practically proportionate. At present we are using urea because the method is simple. The concentrating power of the kidney is another function. So these three tests are all valuable, each different from the others. If there is a markedly increased excretion there will be, as a rule, retention. The concentrating power of the kidney is just as specific a function as the excretion of phenolsulphonephthalein itself, or of urea. It has been known for many years that the concentrating power of the kidney is one of the first things that suffer. There is probably only one disease in which the concentrating power is interfered with and the kidneys normal, and that is diabetes in syphilis.

DR. MARTIN KROTOSZYNER, San Francisco: I cannot agree with Dr. Thomas' sweeping condemnation of cryoscopy, a method which, while it will never become popular among urologists on account of its difficult technic, is nevertheless one of the best tests for the determination of the functional capacity of the kidneys that we possess. On the basis of my constantly growing experience with that method, I venture the statement that in the comparatively few doubtful cases where functional tests are of paramount value, cryoscopy probably gives the most accurate prognostic information of all the tests at our command.

In closing I would once more ask you to try the intravenous phlorizin test on your own patients, as I think it possesses great advantages for comparative determination over other tests. I have not included the indigocarmin test in the tabulated comparative estimations, since that test is not applicable to quantitative determinations and thus is less flexible and less accurate than other tests. For purposes of comparative functional determinations I consider of the retention tests, the urea test, and of the excretion tests, the intravenous phlorizin test, the most commodious and accurate. Particularly in doubtful cases the simultaneous application of the comparative urea, phenolsulphonephthalein, and phlorizin tests is apt in almost every instance to give adequate data on relative kidney function.

DR. B. A. THOMAS, Philadelphia: First answering Dr. Krotoszyner, I did not mean to infer that cryoscopy was absolutely valueless, but I do say, so far as its application to the total urine and blood is concerned, that this is practically true, which is the matter of importance relative to prostatectomy. Doubtless in the experience of a few it may still be serviceable so far as individual urines are concerned, but not of any more value than the information to be obtained from the employment of phenolsulphonephthalein or indigocarmin. Unfortunately it affords no more information than the more modern tests and adds difficulty in the technic.

I agree thoroughly with what Dr. Geraghty has said, that what we want to know respecting these various tests is which is simplest, most practical and most reliable. This is the avowed object of the paper. Undoubtedly, with some the results are sufficiently uniform that there need be no particular discrimination. Frequently a second test may and should be utilized to supplement and confirm the findings of the first. Certainly any one will admit that two or more tests are of more value than a single one.

I am just as anxious to adopt the best functional kidney test as any man here, but I have not been shown by my own experience that phenolsulphonephthalein is superior to indigocarmin so far as ease of application, interpretation or reliability of results go. The advantage of indigocarmin is the simplicity of its application. In the past our experience has been largely with the employment of indigocarmin intramuscularly, although recently we have been experimenting considerably with the intravenous use of this substance, using one tenth to one fifth of the intramuscular dose. Employed in this way intramuscular pain, the only objection, comparatively, with phenolsulphonephthalein, is overcome. If merely unilateral kidney function be desired, simple cystoscopy and the observance of the onset of the dye from the respective ureters—chromo-ureteroscopy—suffices to provide the desired information. If quantitative output be desired from the respective sides, obviously the ureters must be catheterized, as in the case of any other functional test, but this requirement with indigocarmin is the exception and not the rule. Herein lies the simplicity and practicability of the indigo test. I have seen cases in which one could not introduce into the ureteral orifices other than the tips of No. 5 catheters. Under such circumstances I defy any cystoscopist to apply the phenolsulphonephthalein test unilaterally. Yet it was a simple matter to determine the functions of the respective kidneys by employing indigo. Thus, in not a few instances, it is impossible to use any test that depends on synchronous bilateral ureteral catheterization.

FACIAL PARALYSIS FOLLOWING PASTEUR ANTIRABIC TREATMENT

REPORT OF A CASE OF FACIAL DIPLEGIA WITH ONSET SEVENTY-THREE DAYS AFTER THE BEGINNING OF PROPHYLACTIC INOCULATIONS *

ROBERT L. LEVY, M.D.
BALTIMORE

A report of "treatment paralysis" following antirabic inoculations should in no sense be regarded as casting the slightest doubt on the advisability of carrying out the Pasteur treatment in cases in which it is indicated. Though hundreds of thousands of persons have, by this means, been prevented from developing an almost surely fatal disease, there are records of only 150 cases in which paralyses have followed its use. Of these patients, twenty-five died.[1]

It is desirable, however, that such cases be placed on record in order that a true estimate of their frequency may be made and, if possible, some light thrown on their obscure etiology.

The following history is of interest, first, because of the occurrence of isolated facial diplegia, an unusual form of "treatment paralysis," and, secondly, because of the remarkably long latent period between the beginning of treatment and the development of paralytic phenomena.

REPORT OF CASE

History.—A. U. N. (Med. No. 36828), a white man, aged 37, storekeeper, from Plymouth, N. C., was admitted to the medical service, Nov. 14, 1916, with paralysis of the face and pains in the head. The family history was unimportant. There had been no nervous diseases in the family. The general health of the patient had been good, though he was of extremely nervous temperament. At the age of 9 he had what his physician called "hemorrhagic fever," and at 21, 27 and 32, gonorrhea. He denied syphilis. He was a heavy smoker but a very moderate user of alcohol. He had been married eight years. There had been no children.

Aug. 20, 1916, he was scratched on the arm by a supposedly rabid dog, which died a few days later. The wounds were cauterized with phenol. The head of the animal was sent by express to the laboratory of the North Carolina Board of Health, and examination of the brain revealed no Negri

* From the Medical Clinic of the Johns Hopkins Hospital.

1. A review and critical analysis of this group of cases may be found in Remlinger: Ann. de l'Inst. Pasteur, 1905, **19**, 625. Simon: Centralbl. f. Bakteriol., Orig., 1913, **68**, 72. Fielder, F. S.: THE JOURNAL A. M. A., June 3, 1916, p. 1769. Geiger, J. C.: THE JOURNAL A. M. A., Feb. 17, 1917, p. 513.

bodies. In spite of this assurance, he became extremely apprehensive and, against the advice of his physicians, insisted on taking the Pasteur treatment, which he received at the State laboratory in Raleigh from Aug. 31 to Sept. 19, 1916. On the fourth day of treatment he began to have sensations of "something crawling under his skin," first in one place, then in another. In addition, there were "neuralgic" pains in the lumbar region and in the muscles. These symptoms had persisted. Two weeks before admission he began to feel muscular twitchings, especially in the head, neck and legs. Six days before coming to Baltimore, a severe bitemporal headache appeared, and had not been relieved by sedatives. On rising in the morning, three days before admission to the hospital, he noticed that the left side of his face was paralyzed.

Physical Examination.—The patient was extremely neurotic and much concerned about his condition. He frequently became lacrimose during the recital of his history. The temperature, both on admission and subsequently, was normal. He was large and well nourished. There were several pigmented scars about the left elbow, evidently the remains of his carbolized wounds.

There was complete left facial paralysis, without sensory disturbance on either the face or the tongue. There was marked lacrimation from the left eye.

The pupils reacted normally. There were no eye-muscle palsies. The eyegrounds were normal. The heart and lungs were clear. The blood pressure was 142 mm. of mercury systolic and 92 diastolic. The liver and spleen were not felt. There were no fibrillary twitchings; no muscular weakness or atrophy. Neurologic examination, save for the facial paralysis and slightly exaggerated deep reflexes, was negative.

A special nose, throat and ear examination revealed no abnormalities. Both cochlear and vestibular divisions of the eighth nerves were intact.

The urine contained no albumin, sugar or casts. Blood examination revealed: red blood cells, 4,346,000; white blood cells, 5,800; hemoglobin (Sahli), 82 per cent. The differential count was normal. The Wassermann reaction on the blood serum was negative.

November 20, the condition was unchanged. There was no further paralysis. Psychic symptoms were abating.

Lumbar puncture was performed. A clear fluid was obtained, containing eight cells and no excess of globulin. The Wassermann and colloidal gold reactions on the fluid were negative.

November 22, electrical examination of the facial muscles gave the following findings: Feeble response was obtained through the nerve on the left when stimulated with the faradic current. Direct stimulation of the muscles with the faradic current caused some contraction, but excitability was markedly decreased. When stimulated directly with the galvanic current, the muscles responded more slowly on the left side than on the right, and there was decreased excitability. Cathodal closing contraction was greater than anodal closing contraction.

November 27, the patient complained of stiffness of the right corner of the mouth and of an increase in the "feeling of something crawling over the body." There was slight weakness of the lower right side of the face.

November 28, the entire right side of the face was paralyzed, except for the right frontalis muscle, which contracted slightly. There was great difficulty in keeping food within the oral cavity. The expression was mask-like.

November 30, the patient was very nervous. Control of the right half of the face was now completely lost. He was having local electric treatment every other day.

December 4, the patient complained of numbness of both legs. There was no objective sensory disturbance over the body. There was marked dulling of taste sensation over the

TABLE 1.—REPORTED CASES OF FACIAL PARALYSIS FOLLOWING ANTIRABIC TREATMENT

Case No.	Author	Demonstration of Rabies in Biting Animal	Age of Patient*	Facial Paralysis Noted: Days After Bite	Facial Paralysis Noted: Days After Beginning of Treatment	Facial Paralysis Noted: Extent	Result	Remarks
1	Darkschewitz[1]..	No	28	30	7	Bilateral	Recovery after 6 months	Patient alcoholic; left-sided facial paralysis appeared two days after right
2	Pfeilschmidt[2]...	Patient not bitten	24	About 60 after supposed infection	24	Bilateral	Recovery in about 3 weeks	Patient syphilitic and very neurotic; did a necropsy on a rabid dog, and though uninjured, took treatment prophylactically; illness began on the eleventh day of treatment, after which no further injections were given; interval of four days between paralysis on the two sides; at time of complete diplegia, taste disturbed over anterior third of tongue
3	Borger[3].....	No	?	25	24	Unilateral (right)	Well in 14 days	Illness began with sciatica on sixteenth day of treatment; injections continued; associated with the facial paralysis there was dulling of the sensation of taste
4	Jochmann[4].....	Yes	30	22	18	Unilateral (right)	Well in 14 days	Illness began with sciatica on eighteenth day of treatment; still complained of paresthesias of legs on discharge from hospital
5	Hasseltine[5].....	Questionable; probably yes	52	22	23	Bilateral	Recovery in 3 weeks	Paralysis developed after exposure to cold wind; patient alcoholic; interval of one day between paralysis on the two sides
6	Fielder[6].....	Yes	37	53	18	Bilateral	Recovery after a few weeks	Interval of three days between paralysis on the two sides
7	Fielder[6].....	Questionable	Adult	54	23	Unilateral (right)	Recovery after 4 weeks	
8	Fielder[6].....	Questionable	Adult	53	31	Unilateral (right)	Recovery after 2 weeks	
9	Fielder[6].....	Questionable	Adult	29	16	Unilateral	Complete recovery after 6 months	Illness began with pain and weakness in legs
10	Geiger[7].....	Yes	Adult	21	17	Unilateral	Traces 9 months later	
11	Levy[8].....	No	37	84	73	Bilateral	No improvement after 3 weeks in hospital; traces 9 months later	Patient very neurotic; interval of eleven days between paralysis on the two sides; at time of complete diplegia, dulling of taste over anterior two-thirds of tongue

* The patients were all men with the exception of Case 10, in which the sex is not noted.

1. Darkschewitz: Neurol. Centralbl., 1898, **17**, 98.
2. Pfeilschmidt: Neurol. Centralbl., 1908, **27**, 1066.
3. Borger: Geneesk. Tijdschr. f. Nederl. Indië, 1911 (cited by Simon)
4. Jochmann: Deutsch. Ztschr. f. Nervenh., 1913, **47** and **48**, 267.
5. Hasseltine: Pub. Health Rep., 1915, **30**, 2226.
6. Fielder: THE JOURNAL A. M. A., June 3, 1916, p. 1769.
7. Geiger: THE JOURNAL A. M. A., Feb. 17, 1917, p. 513.
8. Levy: Present report.

anterior two thirds of the tongue on both sides. He frequently mistook bitter for sweet, salt for sour, etc., and was much concerned about his condition. He left the hospital at his own request. He was advised to continue electrical treatment to the face at home.

A note from the patient's physician, June 25, 1917, stated that "Mr. N. is not taking any treatment now. He is very little better, judging from the appearaance of his face."

The following extracts from a letter received, Nov. 20, 1916, from Dr. C. A. Shore, director of the Laboratory of Hygiene of the North Carolina State Board of Health, furnish further interesting data:

"Mr. N. received antirabic treatment in this laboratory from August 31 to September 19, inclusive. I do not think that Mr. N. needed this treatment and I strongly advised against it. In the first place, the suspected dog did not bite him, but merely scratched his arm, on August 20. The dog died, according to Mr. N.'s statement, on August 24. The head was expressed to us; the brain was in good condition when received and the microscopic examination failed to show any Negri bodies.

"We have treated 1,620 patients in this laboratory, and from this number, excluding that of Mr. N., there has been only one case of paralysis. This developed on the fourteenth day of treatment. The patient had a complete paralysis of the lower limbs and partial paralysis of the muscles of the arms and trunk. I have never been sure whether it was a case of infantile paralysis or a paralysis resulting from the antirabic treatment. The patient was 15 years old at the time and made a complete recovery.

"The schedule of treatment which we use in this laboratory at present is that recommended by the Hygienic Laboratory of the U. S. Public Health Service."

COMMENT

A majority of cases of "treatment paralysis" have developed while the patients were receiving the injections; about one quarter, according to Simon, within seven days thereafter. Fielder cites an instance of facial paralysis with onset thirty-one days after beginning treatment, and Geiger a case of neuritis, with spasmodic contraction of the neck muscles, occurring forty-five days after the first inoculation.

In spite of the fact that in the case here reported seventy-three days elapsed between the beginning of treatment and the onset of paralysis, there can be no reasonable doubt as to the direct relationship between the antirabic therapy and the facial diplegia. Symptoms began after the fourth injection and were similar to those described in other instances of "treatment paralysis." Furthermore, the gradual development of paralysis of the right side of the face while the patient was under careful supervision in the hospital ward makes it highly unlikely that this was an example of simple Bell's palsy.

In the literature are to be found records of ten other cases of isolated facial paralysis following antirabic treatment. These are collected in the accompanying table.

An analysis of the table brings out the following points:

1. In at least three instances, the biting animal was proved nonrabic.

2. All cases in which complete data are available occurred in adult males.

3. The earliest appearance of the facial paralysis was on the seventh day, the latest, exclusive of the present case, was on the thirty-first day after beginning treatment.

4. In six cases the facial paralysis was unilateral, in five bilateral.

5. In the bilateral cases, an interval of from one to eleven days elapsed between the development of paralysis on the two sides. In no instance were both sides of the face paralyzed at onset.

6. Dulling of taste over the anterior portion of the tongue accompanied the facial paralysis in three instances.

7. Nine of the eleven patients recovered. In two cases there were traces of paralysis nine months later.

8. Of 150 reported cases of treatment paralysis, eleven, or 7.3 per cent., have been of the isolated facial variety.

The etiology of these paralyses is still in doubt. The various theories as to their causation have recently been adequately discussed by Fielder, who sums them up as follows: "There is no doubt that in most of the cases, at least, the symptoms are caused, not by street virus infection, modified by the treatment, but by the treatment itself either through the medium of fixed virus infection or through the action of a toxin, or both. In any event there must be a special idiosyncrasy on the part of the patient. Otherwise the cases would be enormously more frequent than they are." Alcoholic, syphilitic and neurotic individuals are said to be particularly susceptible.

Obviously no special form of therapy based on etiologic considerations can be carried out.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

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Action, Uses and Dosage.—See New and Nonofficial Remedies, 1917, p. 105, under Tyramine.

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SATURDAY, DECEMBER 1, 1917

A PROBLEM CONCERNING EDIBLE FATS

"The great changes which the theories of the science of nutrition have undergone in the course of the past few years," we are reminded by Halliburton and Drummond[1] of London, "are now being rewarded by valuable practical applications of laboratory results to the great problems of animal nutrition, and the national welfare. Such a problem is that which deals with the determination of the relative value as foodstuffs of dairy butter and its numerous substitutes." These authors have accordingly undertaken to expand our knowledge in this field by a study of the nutritive value of margarins and butter substitutes with reference to their content of the fat-soluble accessory growth substance.

It deserves to be emphasized that the association of food hormones or vitamins with certain naturally occurring fats, whereby somehow they promote growth in experimental animals, was originally described by American investigators: McCollum and his associates at the University of Wisconsin, and T. B. Osborne and Lafayette Mendel in New Haven. The British investigators in reviewing the progress made in this new field of investigation, confined so largely to this country, point out that although our knowledge of the substance itself is as yet scanty, we are in possession of certain information as to its occurrence. It is present in butter,[2] butter fat,[3] butter oil,[4] egg yolk,[5] cod liver oil,[6] the lower melting point fractions of beef fat,[4] and kidney and heart fat.[7] On the other hand, it is apparently absent from the majority of oils of vegetable origin, since olive oil,[8] almond oil,[9] corn oil, sunflower seed oil, bleached cottonseed oil and linseed oil[9] were unable to replace such a fat as butter in the experimental rations used. The only animal fat as yet found to be entirely deficient in the substance is lard.[10]

The high prices that the usual household fats have demanded in recent times have brought into prominence a large number of so-called butter substitutes. The recent increase in their consumption may truly be called enormous. The higher priced margarins are usually derived from animal fats. Oleo-oil forms their basis. Vegetable oleomargarins are prepared by the utilization of some inexpensive vegetable oil, such as coconut oil, peanut oil, cottonseed oil, sesame oil or maize oil, as a basis. Liquid oils are also being converted into edible fats by the process of hydrogenation. The so-called nut butters or pastes are also replacing the more expensive butter.

The conclusions of the research by Halliburton and Drummond have been thus formulated: The fat-soluble accessory growth substance is present in beef fat and "oleo-oil," and is present in margarins prepared on such a basis. Such margarins are nutritively the equivalent of butter. Coconut oil, cottonseed oil, arachis oil and hydrogenated vegetable oils contain little or none of this accessory substance; hence margarins prepared with a basis of these fats have not an equal nutritive value to that of butter. Nut butters prepared from crushed nuts and vegetable fats are similarly not equal to butter. Lard substitutes prepared from vegetable oils are equal to lard in their nutritive value, both alike being destitute of the fat-soluble accessory substance.

Despite the importance of these researches and the unquestioned information which they furnish in harmony with many data already established by American investigators, we believe that in fairness to the many useful butter substitutes and margarins now available, a word of caution should be uttered. No one has questioned the edibility and the high degree of digestibility of essentially all of these products that have been examined as to their alimentary utilization. In this respect, like the familiar fats, they leave little to be desired. Oleomargarin has long been immune from attack on the ground of poor digestibility by its numerous frequently unfair detractors. On the other hand, the fat-soluble food hormones or vitamins are reported to be present in the leaves of green vegetables as well as in the milk, butter and eggs that are commonly found in the usual dietary. A liberal varied ration is thus likely to avert danger of lack of vitamins. We must not go to the extreme of forgetting the calorific value of fats quite aside from their content of food accessary substances.

1. Halliburton, W. D., and Drummond, J. C.: The Nutritive Value of Margarines and Butter Substitutes with Reference to Their Content of the Fat-Soluble Accessory Growth Substance, Jour. Physiol., 1917, **51**, 235.
2. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1913, **15**, 167.
3. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1913, **15**, 167. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1913, **15**, 311.
4. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1915, **20**, 379.
5. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1913, **15**, 311; ibid., 1913, **16**, 423.
6. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1914, **17**, 401.
7. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1915, **21**, 179.
8. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1913, **15**, 167. McCollum, E. V., Simmonds, N., and Pitz, W.: Am. Jour. Physiol., 1916, **41**, 361.
9. McCollum, E. V.; Simmonds, N., and Pitz, W.: Am. Jour. Physiol., 1916, **41**, 361.
10. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1913, **15**, 167. Osborne, T. B., and Mendel, L. B.: Jour. Biol. Chem., 1913, **16**, 423.

The real danger appears in connection with the enforced rations of the poorer classes. For them, with their limited opportunities of purchase, the main conclusion of Halliburton and Drummond, that among the current products the butter substitutes that can best replace butter presumably are the margarins made of so-called "oleo-oil" from beef fat, seems more pertinent. As the London investigators remark, in ordinary times the consumption of beef dripping, which is considerable among the poor, would to a large extent supply the lacking properties of a vegetable-oil margarin. But at the present time beef itself is expensive, and the opportunities of obtaining dripping are therefore minimized. At the same time the three important foods for children (milk, butter and eggs) have risen in cost, so as to be almost prohibitive to those with slender incomes. The vegetable oil margarins still remain comparatively cheap, and the danger is that unless measures are taken to insure a proper milk supply for infants at a reasonable charge, these infants may run the risk of being fed, so far as fat is concerned, entirely on an inferior brand of margarin, destitute of the growth-promoting accessory substance. Therefore, Halliburton and Drummond conclude, it would be truer economy even for the poor to purchase smaller quantities of an oleo-oil margarin if they cannot afford the luxury of real butter.

ON KEEPING THE FAITH

In the *Deutsche medizinische Wochenschrift* for May 18, 1916, appeared a letter signed by Dr. J. Schwalbe, the editor, which has become famous. While at that time the *Wochenschrift* was coming to this office more or less regularly, that particular issue was not received; and the efforts made to secure a copy were fruitless. A copy of the letter recently came into our hands. This letter is not only one of the important historical documents of the war, but it gives a revealing flash of the spirit that must rule in Germany before that nation can be readmitted to fellowship in the world-state. The facts of the case are clear and simple. The official reason given by the German government in 1914 for declaring war on France was that French aviators had dropped bombs in the vicinity of Nürnberg before any other outbreak of hostilities. This was officially denied by the French government. And there the matter practically rested for the outside world until the publication of Schwalbe's letter in May, 1916. From this letter we quote:

> In my article "French-National Medicine" (No. 11, p. 327, line 1) I mentioned among other things—in political justification and in reply to the accusations of our enemies—that a French aviator had dropped bombs on Nürnberg prior to the declaration of war. I am apprised in a statement which Privy Councilor Riedel of Jena secured from the magistrate of Nürnberg that my memory had failed me to some extent in this matter: Not at all; I read in the newspapers of August 2, 1914, the news item that on that day, according to the statement of the officers of the Nürnberg railroad—forwarded by the semiofficial Bavarian correspondent, Hoffman—to the effect that aviators had been seen on the Nürnberg-Kissingen line of the railway and on the Nürnberg-Ansbach line, and that they had dropped bombs on the right of way. However, further correspondence between Privy Councilor Riedel and the magistrate of Nürnberg has demonstrated that this assertion, which hitherto has never been corrected, and which has been generally accepted by us as evidence of infraction of the rights of nations on the part of French aviators, is in fact erroneous. The Nürnberg magistrate, under date of April 3, 1916, writes as follows: "The army authorities here have no knowledge of any bombs having been dropped by enemy aviators on the Nürnberg-Kissingen and Nürnberg-Ansbach lines either before or since the declaration of war. All statements and news items to the contrary have been proved to be false."
>
> I consider it to be my self-evident duty to make this correction now. It frees the French of the blame which has been placed on them in consequence of this false piece of news.

In the rest of the letter Dr. Schwalbe discusses the "war state of mind," particularly the credence given by the other side to unverified rumors and accusations against the enemy. Dr. Schwalbe frankly avows in this letter that there is no evidence whatever that the Nürnberg bomb-dropping ever occurred. It is hardly conceivable, therefore, that this reason for declaring war could have been put forward by the German government in good faith. No one can look on it as other than a deliberate attempt at deception. Indulgence in fantasies is not a weakness of Prussian officials. The alleged Nürnberg bomb-dropping will take its place in human history along with the forged Ems telegram as a monstrous perversion of human ethics and fair dealing.

Germany can but reap the consequences of repeated official falsification of this sort. We in this country have not forgotten the perjured testimony, perhaps suborned, to which the German government appealed to show the presence of guns on the *Lusitania;* we have not forgotten the childish attempt to controvert the accusations made relative to the torpedoing of the *Sussex* by reproducing a "sketch" made by a submarine commander. The insincere talk of peace in December, 1916, which was later admitted by the German chancellor to have been merely a blind in order to give time for the building of more submarines, is still fresh in our minds. The discrepancy between the profession of good will and friendship by official German representatives in this country and the mesh of intrigue, bribery, arson and worse in which they were really busying themselves can never be forgotten. Where is now the *deutsche Treue?* Who can trust the word of the German government?

This untrustworthiness of official Germany is one of the outstanding facts of the present situation and is one of the principal obstacles to peace. The world in arms against Germany has been taught by Germany herself to suspect every offer of negotiation and to see a dagger concealed in every olive branch. What new trick is afoot? is the question that springs unbidden in the minds of millions whenever a responsible German official hints of peace, of compromise, of dis-

armament. The situation is a terrible one for humanity; it is much more terrible for the German nation. It demonstrates what some one has called the moral bankruptcy of official Germany. What can be worse for a man or for a nation than to be disbelieved, distrusted and suspected in every word and action, of bad faith? It is for this reason that a large part of the civilized world is determined to fight until a decision is reached. No other course is possible. The stake is civilization itself, the honorable intercourse of intelligent human beings.

We know well that not all Germans participate in this worship of treachery and double dealing. The Schwalbe letter is one piece of evidence that no fear of consequences can deter some bold voices from speaking out for truth and fair play. It is in some degree a credit to the fundamental integrity of the medical profession that one of the most candid and momentous confessions of error should come from one of its members. Dr. Schwalbe has kept faith with us, and we send him all honor. Every one must wish that more protests could be raised in Germany against German official trickery and official falsehood. Truth is of the essence of our scientific work, and many of us have felt keen sorrow that larger numbers of our German friends and colleagues were not keeping the scientific faith. It is the only way. Otherwise German science and German honor will become a byword and a hissing. Already men talk of "German faith" and a "German peace."

SEX HORMONES IN FETAL LIFE

From time to time reference is made in a popular way to a superstition that if twins are of opposite sexes, the female is sterile. How unfounded this belief is in the case of human twins appears from an old investigation of Simpson in Edinburgh. He investigated the family history of 123 married women born twin to males, of whom 112 had families and eleven had none. The proportion of childless marriages was not greater than in the general population. It may be that the mistaken notion is derived by analogy from what is known to be the case among cattle. There the facts are different. In about nine tenths of different-sexed twins the female is sterile. Such females among cattle are commonly known as freemartins. The phenomenon is not known to occur among other species.

Lillie[1] of the University of Chicago has furnished a highly probable explanation of this peculiarity of sterility of the female of different sexed twins. It has been assumed by some that the freemartin is merely a modified male. The evidence now furnished by Lillie indicates with more than probability that the freemartin is by heredity a true female. He has concluded that it is modified by the sex hormones of the male twin, which circulate in both individuals during fetal life owing to secondary fusion of the chorions and anastomosis of the fetal circulation of the two individuals.

The question naturally arises as to why there is not a reciprocal relation between two opposite sexed twins. If their blood intermixes why do not the sex hormones of the female exert an effect to alter the male? The answer is presumably to be found in the earlier differentiation of the sex glands of the male in the development of the individuals so that they can exert an influence through the liberation of hormones before the ovary begins to develop. The previous differentiation of the testis thus leads to suppression of specific ovarian tissue from the beginning, in the female; hence the limitation of the freemartin condition to that sex.

The sterility of the female of two-sexed twins—a phenomenon due to the circulation of the blood of the male twin in the female, owing to peculiar fetal vascular connections in twin pregnancies—is limited to cattle because these anatomic conditions are rarely if ever duplicated in other species. Fusions of adjacent chorions are occasionally found in multiparous animals; but there are no vascular connections. In some mammals the conditions of placentation are such as to prohibit chorionic fusion. The problem arises as to how it happens that the sex hormones of the mother, which numerous facts indicate to be responsible for secondary sexual characters,[2] do not affect the reproductive system of the unborn sons. Lillie concludes that the embryo is in some way protected from these hormones circulating in the maternal blood. Either, he says, there is a cessation of production of sex hormones during fetal life, or they are neutralized in some way, or the placenta is impervious to them. The last supposition seems most probable to Lillie.

There is a broad biologic import to these studies. In the lower forms of life, reversibility of sex has been experimentally demonstrated. In the freemartin, a hereditary female, the internal organs of reproduction are usually predominantly male in character, and the external organs usually of the female type. Evidently the male hormones that reach the female fetus do not cause the development of any structure that is not represented embryologically in the normal female; the hormones act in this case merely by inhibition or stimulation of normal embryonic rudiments. To quote Professor Lillie:

For their proper evaluation the results concerning the freemartin should be associated with other studies indicating that

1. Lillie, F. R.: The Free-Martin: A Study of the Action of Sex Hormones in the Foetal Life of Cattle, Jour. Exper. Zool., 1917, **23**, 371.

2. What Determines the Development of the Secondary Sexual Characters? editorial, THE JOURNAL A. M. A., Feb. 17, 1912, p. 484; The Modification of Secondary Sexual Characters, Feb. 21, 1914, p. 618; The Corpus Luteum and Secondary Sex Characters, July 24, 1915, p. 337.

zygotic determination of sex is not irreversible predestination, but a quantitative overbalance in the direction of one sex or the other. Sex determination is controllable within variable limits in certain groups, to which mammals must be added as a result of the present study. To determine the means, limits and subsequent results of such control is now one of the most important tasks of biology.

CERTIFIED MILK AND THE BACILLUS OF CONTAGIOUS ABORTION

Certified milk is the term applied to "milk produced under sanitary conditions of exceptional excellence, by the most painstaking methods and under constant supervision and inspection of a medical milk commission." The certified milk of the present day is essentially the outcome of the efforts of the medical profession, and the establishment of such a grade of food product from the dairy has unquestionably had a most wholesome influence for the betterment of the general milk supply and the raising of its sanitary quality. As the herds of cattle involved are systematically subjected to a tuberculin test, and the certified milk that the nontuberculous cows produce is expected to contain less than 10,000 bacteria per cubic centimeter when delivered, such milk has come to have the reputation of being safe even when used in the raw state.

In an investigation lately conducted at the University of California Medical School by Fleischner and Meyer,[1] attention has been directed to the adequacy of the safeguards against the dissemination of bovine tuberculosis as they have been introduced into the highly organized scheme of dairy hygiene fostered by the medical milk commissions. The presence of tubercle bacilli in unheated market milk of the usual quality has often been demonstrated. In the certified milk produced in the San Francisco Bay regions, tubercle bacilli are not present in sufficient number to infect guinea-pigs, the usual test subject, with tuberculosis. If this observation proves to be of more general validity, Fleischner and Meyer maintain that there is no necessity for pasteurizing certified milk on account of any danger that it may possess as a disseminator of bovine tuberculosis to infants.

Quite unexpectedly, however, the California investigators found that *Bacillus abortus*, which is held responsible for infectious abortion observed among cattle, is, for practical purposes, always present in the certified milk produced in the San Francisco Bay regions. Fleischner and Meyer believe it to be not unlikely that in many previous milk tests for tubercle bacilli, the anatomic lesions of bovine abortion disease in the guinea-pig were mistaken for tuberculosis. Furthermore, they say, if *B. abortus* is present in certified milk to the extent evident from these experiments, it is difficult to consider it pathogenic for infants, without, so far as is known, ever having produced recognizable lesions on postmortem examination.

Even if the consensus of the scanty evidence now available is against any probable pathogenicity of *B. abortus* of cattle for man, it must be admitted that there are too few studies on the possible significance of this organism from the standpoint of human health. The California investigations are likely to start renewed consideration of the status of unpasteurized certified milk. There are chapters relative to milk hygiene that seem never to be closed. Revision is, however, the sign of progress toward the best that present day knowledge affords.

1. Fleischner, E. C., and Meyer, K. F.: Observations on the Presence of the Bacillus Abortus Bovinus in Certified Milk, Am. Jour. Dis. Child., September, 1917, p. 157.

Current Comment

THE DEVELOPMENT OF THE MAMMARY GLAND

That the growth of the mammary gland during pregnancy is determined by some form of chemical stimulation rather than through nervous influence seems to be established beyond question. Precisely where the effective agent or the specific hormone that induces growth of the tissue is produced has been somewhat debated. It is essential to distinguish clearly between the developmental changes in the mammary gland, on the one hand, and the factors leading to secretion, on the other. Thus it has been suggested that the stimulus which results in the production of milk is in reality inhibitory in character. By preventing secretion it is assumed to permit the continued growth of the glandular tissue. Lane-Claypon and Starling,[1] whose pioneer investigation in this field is well known, thought that the growth of the mammary gland in their experimental animals was due to the presence of the fetus. The evidence now seems to be conclusive that the corpus luteum—the tissue produced in the ovary as the result of the discharge of an ovum—exerts the influence responsible for the growth changes in the mammary gland during the first part of pregnancy.[2] But since the gland continues to develop throughout the period of pregnancy, while it has been believed that the corpus luteum tends to undergo regressive changes before parturition, the explanation for the later developmental progress has been in question. Ancel and Bouin attributed it to a hormone produced by a special tissue, the myometrial gland, reputed to make its appearance in the wall of the uterus at the site of implantation of the placenta and last until the end of pregnancy. The possibility that the placenta might be a potent source of the growth stimulus has also been considered. The latest experiments of Captain Hammond at the School of Agriculture in Cam-

1. Lane-Claypon, Janet, and Starling, E. H.: Proc. Roy. Soc., B, 1906, **87**.

2. Ancel, P., and Bouin, P., Compt. rend. Soc. de biol., 1909, **66**. Hammond, J., and Marshall, F. H. A.: The Functional Correlation Between the Ovaries, Uterus and Mammary Glands in the Rabbit, with Observations on the Estrous Cycle, Proc. Roy. Soc., B, 1914, **87**, 442.

bridge, England,[3] indicate that in rabbits, at least, the corpus luteum, contrary to the generally accepted opinion, is active during the second half of pregnancy, and that it controls the entire development of the mammary gland. There is a definite correlation between the development of the corpus luteum and the increase in weight of the mammary gland. Indirectly the fetus plays some part, since it appears to be responsible for the continued performance of the corpus luteum. The reputed significance of the myometrial glands is lost in view of their inconstant occurrence. Experiments in which the fetuses were removed without destruction of the maternal placenta have shown among others that the latter is not the source of the stimulus which causes the glandular phase of the mammary gland. There is no evidence that the secretory stage is due to anything different from that which causes the growth changes. Apparently, Hammond says, the secretion of milk results whenever the influence causing the glandular growth is removed or lessened in amount. In this case, then, milk secretion takes place in correlation with the involution of the corpus luteum.

TAXES—JUST AND UNJUST

In war it is essential that every citizen give freely of his time and strength to the cause. It is also his duty to pay the taxes that war renders necessary, cheerfully and promptly, without any thought of evasion. Nevertheless, if by error in judgment, or error not intended, there is legislation that results in inequality in taxation, so that one individual is burdened while another in practically the same condition escapes, it is proper to urge on our legislators the need of correction. As some of our readers know, Section 209 of the present war tax law directs that in addition to the income taxes and surtaxes, there shall be an additional tax of 8 per cent. in the case of professional men after an exemption of $6,000. The result is a manifest injustice in that a physician who has no other income but that produced by his own earnest efforts pays this tax of 8 per cent., in addition to the normal income and surtax, whereas the youth who has inherited from his father an amount of money that enables him to live in ease on the interest derived therefrom is not so taxed. Section 209 is a penalty on brains and hard work, and favors inherited wealth. Senators and representatives have acknowledged that it was slipped in without its effects being appreciated or without their knowledge, as a last minute addition after the final conference, and that at the coming session in December an effort will be made to correct or amend Section 209. When Congress convenes, an endeavor will be made to eliminate this "joker" from the law. Physicians whose gross annual income exceeds $6,000 are, of course, interested in this proposition, and should bring influence to bear on their congressmen to get a bad law rescinded.

3. Hammond, J.: On the Causes Responsible for the Developmental Progress of the Mammary Glands in the Rabbit During the Latter Part of Pregnancy, Proc. Roy. Soc., B, 1917, **89**, 534.

MEDICAL PIONEERS OF KENTUCKY

The issue of the *Kentucky Medical Journal* for November 1 is an historical number, edited by Dr. J. N. McCormack. "Recognizing that history, after all, is little more than a succession and tactful combination of selected biographies," the editor has undertaken the "task of collecting and preserving in a somewhat permanent form such still available data . . . as might . . . be useful as the foundation of such a history of that day as would be worthy of the actors whose momentous deeds it recorded." The volume is largely a compilation of biographic sketches recording the professional work of the several subjects and is grouped under the following heads: the McDowell Group, the Transylvania University Group, the University of Louisville Group, and the General Kentucky Group. It is profusely illustrated with portraits of Kentucky physicians, many of whom gained recognition as leaders in the American medical profession. These memoirs of physicians who accomplished so much for scientific medicine in the Middle West under inadequate facilities must be an inspiration for the present and future research work in both the art and the science of medicine. This particular issue of the *Kentucky Medical Journal* contains over one hundred and seventy pages and is deserving of the highest praise not alone from an editorial point of view, but also from its general mechanical and typographic arrangement and make-up. Kentucky has set an example for other state associations to follow.

Effect of High Prices on the Consumption of Milk.—To determine to what extent the high price of milk had affected its consumption among the children of the poor, an investigation was made in October under the joint auspices of the Department of Health, the New York Association for Improving the Condition of the Poor and a Committee on Milk appointed by the mayor, among 2,200 New York families each containing from two to six children, or 12,439 individuals in all. Of these 4,467 were adults and 5,438 were children under 6 years. The total amount of milk purchased by these families was 3,193 quarts as against 4,797 quarts a year ago. This decrease was partially offset by the daily purchase of 141 tins of condensed milk. The amount of milk which physiologists and pediatrists have estimated as the normal amount required by all of the persons considered is 8,194 quarts. It was found in the investigation that 121 families were getting more milk than a year ago, 599 families were getting the same amount, 1,480 families were getting less, and 420 families were now getting more condensed milk. Of the families getting less milk, over half (969) were getting from 25 to 50 per cent. less. Two thousand one hundred and forty-eight children under 6 years of age were drinking tea and coffee. The foregoing is set forth in the *Weekly Bulletin* of the Department of Health, Nov. 3, 1917. The commission appointed by Mayor Mitchel to investigate and report on the possibility of preventing a further increase in the price, or of lowering the present high price, which was 14 cents as against 9 cents a year ago, in their representations to the dairymen's league made the following statements (same publication): 1. The present high cost of milk has reduced the total supply of the city by approximately 25 per cent. 2. In many sections of the city it has reduced the quantity of milk used as much as 50 per cent. 3. In some sections of the city the quantity used by infants and children has been reduced below the minimum which the best medical science considers necessary for the maintenance of health. 4. There has been a recent increase in infant mortality which the health department believes to be due to a decreased use of high grade milk.

Medical Mobilization and the War

MEDICAL MISSIONS FOR ROUMANIA

A medical mission under command of Col. Walter D. McCaw, Manila, P. I., M. C., U. S. Army, consisting of medical officers and nurses, has been organized by the Surgeon-General for service in Roumanian hospitals. Colonel McCaw will report to the American minister at Jassy.

According to the *British Medical Journal*, a Japanese medical corps of 100 men has gone to Roumania to help control the epidemic of typhus in that country, with headquarters at Jassy.

AMERICAN SPAS AND THE WAR

In England and France the military authorities are making use of the hydrologic resources of the spas of those countries in the treatment of convalescent soldiers. Dr. Guy Hinsdale has called attention to the extensive use of these spas by the English and the French, and suggests that an inventory of American hydrologic resources should be taken.

THE CARREL-DAKIN TREATMENT OF WOUNDS

Report of Special Committee Appointed by the Director-General of the British Army Medical Services

A committee appointed by the director-general of the British Army Medical Services for the purpose of investigating and reporting on the Carrel-Dakin treatment of wounds has made its report (*British Medical Journal*, 1917, **2**, 597). The hospitals visited were Carrel's, which at the time of the visit was under the surgical care of Guillot; the clinics of Tuffier and Chutro in Paris; the American Ambulance in Paris, and Mrs. Depew's Hospital at Annel. In Carrel's, Tuffier's and Chutro's clinics, only Dakin's fluid is used. In the Annel Hospital, three fluids are used with Carrel's tubes —Dakin's fluid, eusol[1] and ether. The committee was assured that good results were obtained from each of them. The committee points out that it is evident that in estimating the value of the Carrel-Dakin treatment, care must be taken to appraise quite separately the method of applying the antiseptic and the antiseptic employed. While convinced that the use of Carrel's tubes, as the committee saw them employed, is a very valuable means of applying an antiseptic fluid to a wound, the committee is not satisfied that Dakin's fluid is markedly superior to eusol, and was prepared to find that other antiseptics can be used with advantage by the Carrel method.

The results of the Carrel-Dakin treatment, as seen in a large series of unselected cases, were remarkably good. The most striking evidence of the value of the treatment seen by the committee was a printed notice put up in a prominent place in Tuffier's wards, said to be the expression of his own opinion after a considerable experience of the Carrel-Dakin treatment. The notice is as follows:

"Tout blessé qui suppure a le droit d'en demander la raison a son chirurgien" (every patient whose wounds suppurate has the right to demand an explanation of his surgeon).

The committee is of the opinion that the Carrel-Dakin method of treatment, if carried out thoroughly, is full of promise, and believes that it will (1) diminish the dangers incidental to sepsis, including secondary hemorrhage; (2) hasten the patient's convalescence; (3) lessen the liability to stiff joints and cicatricial deformities; (4) enable the patients to leave the hospital with better general health than they otherwise might, and that (5) when secondary operations become necessary, these operations are more likely to be free from septic complications than when some other system of primary treatment has been adopted.

1. Eusol (Edinburgh University solution) is an acid solution of hypochlorites prepared by shaking 12.5 gm. of chlorinated lime, and 12.5 gm. of powdered boric acid with 1 liter of water. The mixture is allowed to stand for some hours, and is then filtered.—Useful Drugs, 1916, p. 44.

NEWS OF BASE HOSPITALS IN FRANCE

Notes of Interest Gathered During a Tour of Several British and French Hospitals

[In a personal note accompanying this communication Captain Hirschman says: "I am sending herewith a report of observations I made while on special detail in one of the busy districts of France. It was considered of sufficient interest to the Chief Surgeon, Lines of Communication, American Expeditionary Forces, France, to have it sent to, and read by, the Medical Staff of all the base hospitals. . . . We of the Harper Hospital Unit, of Detroit (Base Hospital No. 17), are fortunately situated in an old city full of historical interest. The main building of our hospital is an old seminary building, which adapts itself very readily to hospital purposes. We are enlarging our hospital to 1,200 bed capacity."]

In all the hospitals the Carrel method of using hypochlorites is universally employed in the treatment of all infected wounds, and also as a prophylactic treatment for all wounds of which the slightest doubt is entertained. Punctured wounds are converted into incised wounds, all badly bruised tissue is excised, and Carrel-Dakin solution is started at once. Plenty of rubber tubing must be used, and the skin surfaces around the wounds well protected by gauze saturated with petrolatum. It must be remembered that the Carrel-Dakin tubes are used to bring the solution in contact with every portion of the wound, and are not used in any sense as drainage tubes. The solution is used at room temperature and not by the so-called drop method.

Bacterial counts are made daily or every other day until the number of micro-organisms is reduced to one half to a field. When this time arrives, physiologic sodium chlorid solution, or artificial serum, as the French call it, may be substituted for the Carrel-Dakin solution. In some cases the wound is sutured at this time with satisfactory results. Some British hospitals use an iodoform-bismuth petrolatum paste as a dressing following the Carrel-Dakin treatment.

HOSPITAL TRAINS

Some very beautiful examples of color photography and ordinary photography with the use of the yellow filter were observed. Very few end-results were seen because of the necessity of evacuating the hospitals as soon as patients can be transported comfortably to England for convalescence.

The hospital trains as used by the British are models of completeness and sanitary excellence. They consist of passenger coaches of the finest type, more like the American car than anything else seen on this side of the water. The ordinary hospital train consists of one car with compartments for the commanding officer, his one or two assistants and the nursing sisters, along with mess and bathing facilities for each group, an operating and dressing room car, a car for baggage and supplies, a varying number of ordinary coaches for the ambulant patients, and coaches provided with racks on which the stretchers containing the recumbent patients are placed. These racks are so constructed that three tiers of stretchers can be accommodated on each side of the aisle.

One of these hospital trains will accommodate as many as 500 or 600 patients. A patient is never removed from the stretcher from the time he is placed in the ambulance at the evacuating point until his reception on the hospital ship, and in some cases until his arrival at the convalescent hospital in England. The skill, ease and rapidity with which patients are handled is remarkable, and the happy expressions on the faces of even the severely wounded and seriously ill is the best evidence of the satisfactory manner in which the transportation of the sick and wounded is being carried out.

The hospital ships are equipped in much the same manner as the hospital trains, large wards taking the places of the rack cars.

The Carrel-Dakin treatment is carried on in hospital trains and ships just as carefully as in stationary hospitals. Minor operations and dressings are done with great success in the operating rooms of both classes of invalid transport.

The majority of the cases in the hospitals in this district are medical rather than surgical, the proportion being about 60:40 per cent. The average stay of the patient in the hospital is from eight to ten days. The principal diseases found are trench fever, pyrexia (of unknown origin), pneumonia, pleurisy, gas infection, gastro-enteric infections, kidney and heart diseases, and other diseases as met in civil practice.

SURGICAL NOTES

One thing that has impressed the observer in his tour of the hospitals has been the fine team work between the various medical officers as observed everywhere, and nowhere to

better advantage than in British General Hospital No. 1, which is manned by Americans. The American base hospital unit as organized at present has a well balanced medical staff representing all of the specialties. This has been taken advantage of in the treatment of all patients, so that each specialist is enabled to give his best efforts to those to whom his services are of the greatest value, and to bear his share of the routine ward work, which is cared for by all.

While our hospital units were organized primarily to care for 500 patients, unusually heavy convoys have increased the number of patients to over twice the original capacity. Experience has proved that the number of medical officers, from twenty-six to twenty-eight, is sufficient even for the increased number of patients cared for at times; but both the nursing and the enlisted staffs are inadequate to the demands thrown on them. Instead of sixty-five nurses, 100 would be the proper number to give adequate nursing service with justice both to patient and to nurse, while fifty additional enlisted men would be able to care for the extra 500 patients without difficulty.

The utilization of railroad stations, hotels and other large buildings has worked out in a very satisfactory manner. Most of the buildings seen by the observer have been wonderfully well adapted to hospital purposes. Extra ward space has been provided by the building of temporary huts accommodating from twenty to forty patients each.

Separate hospital buildings are provided for sick and injured officers, and also in a large center like Havre a special hospital is operated for sick nursing sisters.

Isolation hospitals and convalescent camps also serve their useful needs, and a new convalescent hospital capable, I understand, of accommodating up to 40,000 patients, is now being built by the British at ———.

ORGANIZATION

A surgical ward containing from forty to eighty beds is in charge of a senior and a junior medical officer and a supervising nurse with three assistants. The usual hours for nurses' duty are from 7:30 a. m. to 8 p. m. with a half hour off for noon meal, breakfast being taken before going on duty and dinner when coming off duty in the evening. If work is light, an hour for recreation is allowed in the latter part of the afternoon. In British General Hospital No. 1 at ———, a number of nurses' aides, having from one to two years' experience, are utilized and give great satisfaction. They do everything for the patients except surgical dressings and administration of medicines, and relieve the graduate nurses of a great deal of work, thus allowing them to assist the surgeons in making surgical dressings.

When a convoy arrives from the front, patients are taken from the hospital train to the hospital usually in motor ambulances, are sorted out according to their field diagnosis cards, and are allowed to rest for a couple of hours. Then each patient is bathed carefully, dressed, and a more definite diagnosis made. Unless operation or the roentgen ray is urgent, these are put off until the following day. All patients receive a preliminary dose of 500 units of antitetanic serum at the casualty clearing station, and a second dose in the hospital in from six to ten days after the first injection.

A wound, whether sutured or not, which presents local tenderness and infiltration and is not necessarily edematous and visibly infected, is incised at once and the incision carried through fascia or aponeurosis so as to allow the muscle to bulge freely. Carrel-Dakin treatment is started at once as a prophylactic measure. Many wounds of large size are not treated thus, but are exposed to sunlight with great success. A large shell wound of the thigh or buttock, for instance, will be given all the sunlight the patient can stand by moving his cot to the most exposed location, shading his face and covering the part with mosquito bar. This treatment is also very efficacious for extensive burns.

In the dressing of painful wounds, a very valuable method of anesthetizing the patient is used without danger, even though required daily. The formula of the anesthetic is: ethyl chlorid, 5 c.c.; chloroform, 1 c.c.; ether, 24 c.c. A piece of flannel cloth is saturated with the entire amount and placed over the patient's face. This is covered with another piece of flannel, and this in turn is covered with oil silk containing a small aperture, fitting over the nostrils. This is tied around the patient's face with a bit of tape or rubber tubing. The anesthesia produced will last for ten minutes, and the dressing can be started on the second breath. This anesthesia is apparently devoid of danger, is not accompanied by unpleasant complications, is followed by no deleterious after-effects, and is welcomed by the patient.

It has been found of great value, although the officer of the day attends to all emergencies, to have him call the physician or surgeon in charge of the ward if a severe hemorrhage or unusual emergency arises at night. The officer of the day occupies a special bedroom at night which is known to every one so that no time is lost in reaching him if needed.

In all of the hospitals visited, both French and English, the supply of anesthetics, instruments and paraphernalia generally seemed to be ample.

The food in all hospitals was of good variety, the quantity ample, and its preparation very satisfactory.

In hospitals not housed in permanent buildings, both wooden huts and canvas tents of various types are utilized. It has been observed that canvas tents with double walls allowing an air space of from 4 to 6 inches between are much warmer than wooden huts.

DISPOSAL OF REFUSE

It was noted with interest that in the disposal of garbage and kitchen refuse, every effort is made to save all of the fats and drippings. As these are separated from the rest of the garbage, they are run into tanks containing water which is slowly and constantly changing. The fat rises to the surface of the water and at intervals is skimmed off, gathered up and saved for glycerin making. The rest of the garbage is incinerated.

In some places large settling pits are dug, and are filled with old tin cans which have been previously flamed. Wash water and other liquid refuse from laundries and kitchens are allowed to drain into the ground through these pits.

Nothing has been observed in any of the hospitals, barracks or camps visited which in any way can compare with the latrines as devised and used by the American Army. Incineration of the feces is the method of disposal, and while it in itself is undoubtedly very satisfactory, it involves an unnecessary amount of labor in the cleaning out of latrine cans and the conveying of this material to the incinerators. A disagreeable and unhealthy stench is produced during the whole process, which is entirely obviated by the method of the American Army. The same criticism applies to urinals. The urinals observed usually consisted of ordinary galvanized iron or tin troughs which receive no other attention than an occasional flushing.

DELOUSING STATIONS

The delousing stations, which are important adjuncts of every hospital, consist of portable steam sterilizing outfits into which the clothing of new patients is placed. All clothes are subjected to steam sterilization at 215 F. for from one hour to an hour and a quarter, and then allowed to dry out in the sterilizer for forty minutes thereafter.

Some hospitals have been achieving very satisfactory results in the treatment of infected wounds, particularly of joints and sinuses, by the injection of eusol, which is a solution of chlorinated soda somewhat similar to the Carrel-Dakin solution but of greater germicidal power. This is injected directly into the diseased area every two hours or through tubes, the same as the Carrel-Dakin solution.

In some institutions ether was the anesthetic of choice, while in others nitrous oxid and oxygen was the anesthetic most frequent used.

SUTURING OF WOUNDS

One thing noted by the observer has been the amount of unnecessary surgery and after-treatment as well as undue prolongation of hospital confinement and subsequent unnecessary absence from the line, a large part of which can be avoided. This is due to too much unnecessary suturing of wounds in the casualty clearing stations.

While it is recognized that hemorrhage must be checked, sometimes by ligature and again by suture, immediate closure of wounds in these stations is to be severely condemned. Many infected wounds seen by the observer have required immediate reopening, removal of sutures and Carrel or similar treatment, because of the stitching done in the casualty clearing stations.

A great deal of unnecessary time and labor is spent in work which only has to be undone and which really is to the detriment of the patient. In many cases wounds really should be enlarged and packed instead of closed in order to afford opportunity for cleansing and drainage. The minimum amount of suturing consistent with safety from hemorrhage should be employed. A further treatment of the wound should be left to the hospitals farther back from the line. As suturing takes time and material, this work is not only unnecessary but also harmful, and is a break in the chain of efficiency which should not obtain in our system of medical relief.

BRITISH GENERAL HOSPITAL FOR VENEREAL DISEASES

British General Hospital No. 39 is a large institution of over 3,000 beds devoted entirely to the treatment of syphilis, gonorrhea and chanchroid. Four hundred of these beds are for officers. This is one of four similar hospitals conducted by the Royal Army Medical Corps for the treatment of these diseases. It is situated in the suburbs of ——— amid beautiful surroundings. It consists of huts, bungalows and tentage, the streets are well paved and perfectly drained, rows of shrubs and flowering plants line these streets, and has everything conducive to the comfort of the inmates.

A well equipped operating room with special wards for surgical patients is one of the many good features of the institution. The salvarsan room contains six tables with arm rests, irrigator stands, etc., and the intravenous treatment is frequently given to six patients at the same time. The intramuscular injection of neosalvarsan is used in a great many more cases than the intravenous—of old salvarsan—and with most excellent results.

The number of syphilis patients treated in this hospital since Jan. 1, 1915, was 11,500. To these patients were administered over 89,000 injections of salvarsan and neosalvarsan. The number of cases of dermatitis and jaundice developing was only 152, and the number of deaths occurring in this whole series was either ten or eleven.

As a result of the treatment in this hospital, the number of troops returned to the front effective for duty was over 11,000; while the number invalided to England in the last year was only seventy, which is but a fraction of the number heretofore sent home.

The French and English preparations similar to neosalvarsan and old salvarsan have proved fully as efficacious, and the standard treatment for syphilis in this hospital consists in the combination of the intramuscular injection of a suspension of metallic mercury in sterile oil and water in conjunction with the intramuscular injection of neosalvarsan, as well as the intravenous use of old salvarsan.

The Wassermann test is used in all cases before the men return to the front; but patients symptomatically cured even though exhibiting a positive Wassermann reaction are nevertheless returned to the front because they are again effective for the full military duty.

The proportion of cases of syphilis to gonorrhea is 1:3. Gonorrhea here as elsewhere has proved more resistant to treatment than syphilis. The recent cases are treated with a 1:4,000 solution of potassium permanganate, used in the ordinary way as urethral irrigations. The cases of long standing are being treated with gonococcus vaccine, which is made in the hospital laboratory, and also by means of urethral bougies impregnated with any one of the various salts commonly used for the purpose.

On inquiry as to why venereal prophylaxis was not carried out in the British Army as it is in the American, I was informed that public sentiment in Great Britain had not as yet been educated up to the same point as in America, and that the frank discussion of these matters was still more or less taboo. One of the medical officers in charge made the statement that he feared that a soldier contracting a venereal disease and not reporting for prophylactic treatment, as required in our army, would by endeavoring to conceal his condition so neglect himself as to become a more difficult case when concealment was finally no longer possible.

The other three hospitals devoted entirely to this purpose and conducted by the British Army are just as busy as No. 39, so that the enormous number of noneffectives caused by prevalence of venereal disease can be easily demonstrated.

As the startling prevalence of venereal diseases in France has been demonstrated by the experience of the armies stationed here, it is hoped that in spite of our excellent measures of prophylaxis the American expeditionary force will have sufficient hospitals in readiness for the treatment of such of our forces as become infected in spite of all our preventive measures.

THE MICRO-ORGANISM SUPPOSED TO BE RESPONSIBLE FOR SO-CALLED TRENCH FEVER

The most interesting thing observed during my several visits to British General Hospital No. 1 has been the research work being carried on in the hospital laboratory by Captain Pappenheim, M. R. C.

He has isolated a disk-like organism from a number of patients suffering from trench fever, and has grown this organism on artificial mediums as well as on blood serum.

It is found in the periosteum and around the blood vessels of the tibialis anticus muscle but not in the muscle fibers itself, and also is easily found in the stomach walls of the body louse.

The organism, as stated above, is disk-shaped, is about one-thirtieth to one-fortieth the size of a red blood corpuscle, and is best observed when overlying the corpuscle. It stains with the Wright-Giemsa stain (heated), and also with hematoxylin after being fixed with Zenker's solution. It will also stain with hot Azure 2, Ziehl-Neelsen (without much discolorization) and hot ordinary weak carbol-fuchsin. It will not stain with eosin or Gram's stain except faintly. The organisms are evidently protoplasm.

This organism is cultivated by dropping a small fragment of periosteum removed from the tibia into a slant agar culture tube. After four days' incubation a dark cottony cloudiness will appear just below the junction of the agar and the water of condensation. The organism becomes encapsulated in eight days, and appears in a sort of hanging drop formation in the tube. Under the high power, the disk when superimposed on a red blood corpuscle looks not unlike a small crescent-shaped nucleus occupying about one fifth of the area of the disk, the balance being very faintly outlined but nevertheless visible. As many as six will be found in a field. In the organisms which are evidently older, the so-called nucleus appears to be split into a number of sections of irregular shape. These older organisms are distinctly encapsulated.

As stated above, the organism has been found in every case of trench fever in the periosteum of the tibialis anticus, where the pain of the disease is located. It has also been found in the blood in a few cases. Efforts are now being made to perfect the technic of blood culture in this work. The organism has been found with great ease also in the body louse as found on patients returning from the front, and has best been demonstrated in sagittal sections of the stomach wall of the louse.

A preliminary report has been prepared, and it is expected this will be published in a forthcoming number of the *British Medical Journal*.

The work is being carried on in a painstaking manner by Captain Pappenheim and his associates, and it is hoped that other hospital units will find it of sufficient interest to investigate these findings and prove or disprove the connection of this new organism with so-called trench fever.

LOUIS J. HIRSCHMAN, Captain, M. R. C.
U. S. Base Hospital No. 17, American Expeditionary Force, France.

NEWS OF THE TRAINING CAMPS

At Fort Riley

The second three months' period of this medical officers' training camp is nearly completed. The closing of the training camp at Fort Benjamin Harrison and the preparation for the next class of student officers at the camp have resulted in a number of changes in the staff of instructors. Lieut.-Col. H. F. Piper, M. C., comes here from Fort Benjamin Harrison as assistant commandant in general charge of instruction and in charge of student companies. Major H. M. Snyder, M. C., from Fort Benjamin Harrison, is to take command of Hospital Train No. 24. Major F. R. Hill, M. C., is to have charge of the professional examination of reserve officers. Major William H. Tefft, M. C., has been ordered here from Fort Douglas, Utah, to take command of Evacuation Hospital No. 7. Major Robert H. Duenner, M. C., has been ordered from Honolulu to Fort Riley to organize and command Hospital Train No. 25.

Meanwhile, preparations for new companies and for cold weather are going forward steadily. The barracks are being lined with tar paper and sheathing, and every effort is being made to have them warm and comfortable before the winter begins. Yet in spite of the lateness of the season, the beautiful Indian summer weather continues. Day after day of clear sunshine makes the outdoor work and especially the maneuvers a delight.

REGIMENTAL AND BRIGADE MANEUVERS

Following two weeks of training in equitation, each student company is given one week in regimental and brigade maneuvers and one week on a division problem. The first week, various student officers are detailed as regimental and battalion surgeons, and are given written orders directing them to proceed to certain locations designated on the map and to select suitable sites for regimental aid stations. Other student officers are detailed as commanding officers of ambulance companies, and are told to select a location for a

dressing station under certain definite conditions. Other men are sent out with compasses and maps, and are told to find a regimental commander stationed at a point designated on the map and to report to him at a certain hour. In the brigade problem, brigade, regimental and battalion surgeons are appointed, ambulance companies and field hospitals are taken out and moved according to previously issued orders, and all the details of a regimental or brigade problem are worked out. But it is division maneuvers that are most fascinating. Here two companies of student officers are taken out, all the instructors are on staff duty, and all the field hospital and ambulance companies with their entire personnel and equipment are in the field, together with four or five hundred to impersonate wounded. The field of operations extends from Ogden on the east to Junction City on the west, and from North Gate to the Washington Street bridge, an area of about 30 square miles. The colonel himself is in command, and every one prepares for an all day ride.

Right after breakfast, the horses are brought up from the stables, each equipped with saddle bags. In one is the bag of oats that is to form the midday meal for the horse. In the other bag goes the lunch for the rider. The cooks have risen earlier than usual, and have made an incredible number of sandwiches. No thin and ladylike sandwiches are these, with wafer-like slices of bread and a delicate lettuce leaf between, but large, husky slices of camp bread with cheese, ham, roast beef or canned beef between them. The first day, some of the unwise arise from a hearty breakfast and scorn these mammoth hunks of nourishment, or take only a single package. But one day's riding is enough to impress on the shortsighted medical officer the amazing shrinkage that a sandwich can undergo. One that is too large to carry at 7 a. m., is so small by 12:30 that at least three are necessary to convince one that one has had any lunch. Thereafter preparedness is each man's motto. Not only does he fight with the cook to get two packages, but he even tries the time worn yarn about "the fellow in the cot next to mine didn't have time to get any and wants me to get his for him." Some, foiled by the watchful cook, wait a decent interval and then return for a second helping, with elaborate and carefully assumed innocence. But all get enough and the saddle bags are soon bulging, not only with packages of sandwiches, but also with oranges, apples, cakes of chocolate and boxes of cookies and crackers. Canteens, filled with water, tea or coffee, according to the taste of the owner, are swung to the saddle, stirrups are adjusted, girths are tightened and horses are looked over carefully, sometimes it must be admitted with some trepidation, for not all physicians are bold and dashing riders when they come here.

PREPARATION FOR BATTLE

Meanwhile, the field hospitals and ambulance companies, long lines of motor trucks or of mule drawn wagons, have come up and are waiting orders to move. The enlisted men go by in heavy marching order and halt in the road beyond. Then the headquarters automobile appears, orders are distributed to each commanding officer, and one by one the various commands move off to their stations. Only the headquarters staff is left, and finally it receives orders to report at Randolph Hill at 8:30. So off we go on a 4 mile ride. This is the Blue day, and we rode over the entire field yesterday, so every one knows where to go. A Blue army with its base at Manhattan is marching to attack a Red army that is defending Junction City. Randolph Hill, the highest point in the northeast quarter of the reservation, is Blue headquarters. From the top, one can view the entire field. It is a clear, sharp November morning. The sun is just getting up above the hills. The mist lies thick in the valleys, but the wind blows sharp and chill on the hill top. Sheepskin lined coats and heavy gloves feel good, though later on when the sun gets higher, even a khaki blouse will be too heavy.

The staff is gathering on the hill, each group as it comes up dismounting and giving the horses to the orderlies, who lead them to the rear. All gather about the colonel, who as division surgeon is in command of the entire sanitary force. Maps are spread out on the grass, and the Blue position traced out. Soon orderlies on horseback or on motorcycles begin to appear. The battle is on. Each commanding officer as he reaches his position reports to headquarters and receives further orders. Each detachment commander is given several sealed envelops to be opened at 9, 10, 11 and 1:30. In them are orders for him to carry out, by which the progress of the battle is carried on. As each report reaches headquarters, the situation is discussed and members of the staff are asked to suggest a proper solution. As one commander after another reports heavy casualties, the director of ambulances or the director of field hospitals is called on to establish dressing stations, evacuate the wounded, or set up hospitals. An orderly is sent with a message to an ambulance company, awaiting orders several miles away, to advance by a certain road and take care of the wounded. The orderly disappears. Half an hour or an hour goes by without apparent result. Field glasses are brought out, and the road on which the ambulance train is to appear is closely watched. Finally some one shouts, "There they are," and far away, over the crest of the hill, appears the head of the column. Slowly the ten motor ambulances, the trucks and supply wagons, the automobiles and motorcycles wind across the ridge in a long procession and disappear in the valley below. Discussion is now heated. Did the commander expose himself and his train to the Red artillery fire on Morris Hill? If so, is he *hors de combat* or not? Finally, everybody agrees that "Ambulance Company 19 is all shot to hell," and that it is time for lunch anyway. So this interesting but convenient battle stops for lunch. Saddle bags are opened and everybody drops down on the dry, warm grass. Surely those sandwiches can't be as large as they were a few hours ago. Those who have secured a double supply congratulate themselves, while the less thrifty vow that tomorrow they will do likewise. Canteens are passed around, and cigarets, cigars and pipes are produced. By 1:30 the battle is resumed, and by 3 the Blue army is in full retreat, with a large number of wounded that must be cared for by the regimental surgeons, the dressing stations and the hospitals. How are they doing their work? At 3:30, the colonel folds up his map and draws on his gloves. "Mount up, gentlemen. We will ride the Blue battle line." And off we go. All the positions are carefully examined, the location of the regimental aid stations and dressing stations criticized, and the various problems involved discussed. From one position to another we go, sometimes by road or lane, more often across country, working back from point to point until we reach the Blue base, perhaps 8 or 10 miles behind the battle line. Here are gathered all the field hospitals, ambulance companies and sanitary troops. Tents are all pitched in perfect alinement; stoves are unpacked; even operating tables with instruments and basins are ready. Ambulances and motor trucks are parked in long rows. The men that are on field rations are cooking their supper, but all rise and stand at salute as the staff rides past. In front of each company are two flags, the Stars and Stripes and the Red Cross, twin emblems of Liberty and Mercy. We ride past the twenty-four big ward tents, the kitchens, the officers' tents and the long line of pup tents of the men, and finally in the glow of the early evening turn toward camp and supper, tired but feeling sure that of all the good things at Fort Riley, division maneuvers are the best.

DISEASE CONDITIONS AMONG TROOPS IN THE UNITED STATES

Extracts from Telegraphic Reports Received in the Office of the Surgeon-General for the Week Ending Nov. 16, 1917

1. Total strength of troops 1,065,418
   Admission rate per 1,000 (disease only) ..... annual 1,412.7
   Non-effective rate (all camps) 34.9
2. National Guard, strength (camps) 391,199
   Admission rate per 1,000 all camps (disease only) annual 1,697.3
   Non-effective rate all camps (all causes) 42.6
   Camps showing admission rate for disease higher than average: Camps Beauregard, Wheeler, Bowie, Kearney, Sevier and Cody.
   Camps showing non-effective rate all causes higher than average: Camps Wheeler, Beauregard, Bowie, Sevier, Kearney, Shelby, Cody, and MacArthur.
3. National Army, strength (camps) 413,482
   Admission rate per 1,000 all camps (disease only) 1,427
   Non-effective rate all camps (all causes) 28.5
   Camps showing admission rate for disease higher than average: Travis, Pike, Funston, Jackson, Lewis, Dix and Dodge.
   Camps showing non-effective rate all causes higher than average: Camps Pike, Funston, Travis, Jackson, Lewis and Dodge.
4. Venereal Disease—
   Admission rate Regulars ..... annual 94.3
   Admission rate National Guard (camps) ..... annual 74
   Admission rate National Army (camps) ..... annual 95.3
   Camps National Guard having rate above average: Camps Kearney, Beauregard, Wheeler, Sheridan, Logan and Doniphan.
   Camps National Army having rate above average: Camps Jackson, Lee, Gordon, Sherman and Travis.
5. Number of cases of pneumonia 399
   Highest number in any one camp ..... (Pike) 54
   Number of cases of meningitis 48
   Highest number in any one camp ..... (Funston) 13

6. SPECIAL DISEASES REPORTED DURING THE WEEK ENDING NOV. 16, 1917

Division	Pneumonia	Dysentery	Malaria	Venereal	Paratyphoid	Typhoid	Measles	Meningitis	Scarlet Fever	Strength of Command
27th, Wadsworth	4	...	...	31	...	...	....	...	...	31,895
28th, Hancock	1	...	...	30	...	1	1	...	...	28,776
29th, McClellan	4	...	2	18	...	...	2	...	...	26,588
30th, Sevier	45	...	4	19	1	...	700	5	...	27,356
31st, Wheeler	47	...	6	46	...	...	975	2	...	22,681
32d, MacArthur	2	...	1	26	...	1	45	...	2	26,616
33d, Logan	10	...	4	51	...	2	4	...	1	32,764
34th, Cody	4	...	...	14	...	...	160	...	1	25,758
35th, Doniphan	20	...	1	43	...	...	31	4	1	25,674
36th, Bowie	52	...	1	34	...	1	734	1	1	25,641
37th, Sheridan	7	...	...	40	...	...	24	...	1	24,192
38th, Shelby	14	...	4	37	...	...	360	...	...	29,344
39th, Beauregard	10	...	15	41	...	...	918	2	...	16,750
40th, Kearney	5	...	...	100	...	...	38	1	...	24,503
41st, A. L. Mills	6	...	...	27	...	...	32	...	3	22,661
76th, Devens	1	...	...	20	...	...	6	...	...	26,500
77th, Upton	1	...	...	11	...	...	....	...	...	24,332
78th, Dix	...	...	...	38	...	10	....	...	...	16,600
79th, Meade	...	...	...	15	...	...	71	...	...	32,687
80th, Lee	6	6	2	178	...	3	34	3	...	34,520
81st, Jackson	4	...	1	181	...	...	285	...	...	15,414
82d, Gordon	2	...	...	65	...	1	74	1	...	27,789
83d, Sherman	6	...	...	72	...	...	5	2	...	33,063
84th, Taylor	11	...	...	27	...	...	62	1	...	25,152
85th, Custer	...	...	...	6	...	...	30	...	1	15,457
86th, Grant	4	...	...	17	...	...	....	3	1	24,702
87th, Pike	54	...	5	19	...	...	611	10	12	22,387
88th, Dodge	11	...	...	3	...	...	27	...	3	22,866
89th, Funston	45	...	1	40	...	...	118	15	...	26,645
90th, Travis	32	...	9	63	...	...	697	...	...	32,208
91st, Lewis	11	...	...	13	...	...	19	...	...	35,165

	Regulars, U. S. Army, in U. S. only, 1916		Regulars in U. S. week ending Nov. 16, 1917		Nat'l Guard, All Camps, week ending Nov. 16, 1917		Nat'l Army, All Camps, week ending Nov. 16, 1917	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Admissions, diseases only, annual rate per 1000	....	613.00	....	822.6	....	1697.3	....	1427.0
Pneumonia	....	2.59	24	5.6	211	28.0	188	23.6
Dysentery	....	3.97	3	0.7	....	.....	....	.....
Malaria	....	12.52	7	1.6	38	5.0	19	2.4
Venereal	....	91.00	403	94.3	557	74.0	758	96.3
Paratyphoid	....	0.31	....	.....	1	0.1	....	.....
Typhoid	....	0.21	....	.....	5	0.6	15	1.9
Measles	....	20.29	117	27.3	4054	539.9	1988	250.0
Meningitis	....	0.29	....	.....	15	1.9	33	4.1
Scarlet fever	....	0.59	21	4.9	10	1.3	17	2.1

7. Deaths by causes: pneumonia, lobar, 73; bronchopneumonia, 2; cerebrospinal meningitis, 10; tubercular meningitis, 1; meningitis following mastoid operation, 1; tuberculosis, pulmonary, 3; appendicitis, 2; nephritis, 2; diabetes mellitus, 1; pyemia, 1; empyema, 1; malaria, 1; typhoid fever, 1; dysentery, 1; diphtheria, 1; pleurisy serofibrinous, 1; hemorrhage from gastric ulcer, 1; sarcoma of pelvis, 1; suicide, 4; traumatism, 13.

NEWS OF THE CANTONMENTS

Thirty-First Division, Camp Wheeler, Macon, Ga.

BASE HOSPITAL NOTES

Major Richard Weil, chief of the medical service, died on Nov. 19, 1917, of pneumonia, contracted in line of duty. Undoubtedly conscientious work had much to do with his illness and untimely demise. His character, ability and personality greatly endeared him to all the officers, men and patients with whom he came in touch. Brief military honors were given the remains.

The Surgeon-General of the Army and staff visited the hospital, November 23 and 24. In addition to his personal staff, Dr. W. H. Welch of Johns Hopkins University accompanied him in an advisory capacity.

The porches are all screened with canvas and the patients seem happy and content and do not complain of the cold. The permanent stoves have been installed in practically all of the buildings. The officers' and isolation wards are now occupied, leaving the psychiatric ward only without patients.

Heavy clothing is coming at last, and it is hoped that pneumonia will decrease as a result of its arrival.

The hookworm treatment is being generally given, when chenopodium can be secured. This also will, it is hoped, reduce the amount of pneumonia.

SCARLET FEVER AND MENINGITIS

Scarlet fever has appeared in camp, there being in the hospital ten cases. Only two new cases of meningitis have developed since last week.

MEASLES

The epidemic of measles is drawing toward a close. Over 2,800 cases of measles have been treated in the base hospital. The high water mark was 1,201 cases in hospital. The greatest number received in one day was 175 cases. The number of deaths from bronchial pneumonia complication has amounted to a trifle more than 1 per cent. No middle ear or other complications have occurred, excepting bronchial pneumonia, and possibly tuberculosis.

PNEUMONIA

Pneumonia is the fatal disease of the camp and has not decreased with the decrease in measles. The total number of cases of lobar pneumonia has been 243. Of these practically 25 per cent. followed measles, and 75 per cent. was independent of measles. The percentage of deaths has been 11. Of eighty-eight cases, of which the type was determined by inoculating mice, seventeen were of Type I, six of Type II, five of Type III, and sixty of Type IV. A careful study of all pneumonia cases is being made and it is believed that much light will be thrown on the epidemiology of this disease. The theory that it is infectious and that cases are transmitted from other cases, either by direct or intermediate infection, is being insisted on by Colonel Duncan, the division surgeon.

VISITORS

Many distinguished visitors have been drawn to the camp recently; partly by reports of the epidemic of pneumonia.

Mr. W. J. Harris and Senator Hoke Smith were visitors on Wednesday. The daughters of Gen. Joe Wheeler were here on Monday.

On Friday, Surgeon-General Gorgas arrived from Washington, D. C., accompanied by Majors Victor Vaughan, T. C. Janeway, William H. Welch of Johns Hopkins University and Colonel Howard of the Surgeon-General's Office. The Surgeon-General and Majors Welch and Vaughan addressed all the medical officers at 2:30, and all the field officers of the division at 4 o'clock.

Colonel Fisher, medical inspector, was in the camp on Sunday and Monday, going on afterward to Jacksonville.

ONE HUNDRED AND SIXTH SANITARY TRAIN

The equipment of the train has been greatly augmented by the receipt during the past week of three complete equipments for ambulance companies and one equipment, complete, for field hospitals. The motor ambulances for Ambulance Company No. 123 have also arrived, have been assembled and are now in operation. The latter part of last week a consignment of ten Indian motorcycles with side-cars were delivered. This completes probably the motor equipment that will be delivered at this station. The Dodge cars for the motor companies and the directors have not and probably will not come.

The regular weekly social of the train was held in the recreation hall, Wednesday evening, and was largely attended. A most enjoyable evening was had to the strains of the orchestra of the Florida Field Hospital, which is now completed by the acquisition of a snare drum and base drum.

The process of eliminating from the train the large number of accumulated mascots, ranging from wolfhounds to Chihuahua dogs, goats, pet possums and rabbits, is progressing to a successful finish. The next few days will see the completion of this work.

NOTES

Coughs and "colds" are widespread in the camp and in this whole region. The dust, from the continued dry weather, seems to be a factor in the spreading of these coughs.

The Thirty-First Division has finally received a definite name, the Dixie Division, with the insignia ⊡D, two D's, one reversed.

The work of the vice commission and of the local committee has finally begun to bear fruit in a cleaning up of Macon hotels, and in lessening the number of streetwalkers.

There is general comment on the poor class of men furnished by the draft. Many from the rural districts are miserable physical specimens, some with anemia from malaria, other from hookworm, others poorly developed, and all falling an easy prey to measles, pneumonia, or any other infectious disease. Although the weather is not at all bad, being rather fine, there is much sickness among the 10,000 drafted

men; but very little among the 11,000, old guardsmen. While Camp Wheeler is called a National Guard camp, it is now almost one-half National Army, and will be three-fifths National Army when filled to war strength.

The Thirty-First Division has sent no patients to any hospital outside the camp. All patients, from the beginning, have been handled here, first in the field hospitals and later in the base hospital, which has cared for more than twice its rated capacity.

Thirty-Fifth Division, Camp Doniphan, Fort Sill, Okla.

Camp Doniphan and its base hospital were subjected to official inspection this week; Col. William R. Lewis looked after the sanitary conditions of the camp and Major M. Black, M. R. C., investigated the base hospital. Owing to the lateness of the authorization of necessary funds, the sewerage system has not yet been installed, and this will delay the completion of the hospital, it is estimated, for another month and one half to two months; in the meantime concrete cesspools are installed for some of the wards and the quarters for the staff.

The meeting of Wednesday night, November 14, was devoted to discussion of the venereal disease problem. Lieutenant C. A. Coleman, speaking from an extensive experience in private practice, outlined briefly what he believed to be essentials in the handling of the venereal disease problem of the Army. The paper was received with a great deal of interest, and was discussed by officers of the field as well as members of the staff of the base hospital.

Friday night, Capt. Lee H. Bailey of the British Army spoke on the use of the bayonet; though more military than medical, the paper nevertheless was listened to with a great deal of interest.

DISEASE INCIDENCE

The number of infectious diseases unfortunately is still on the increase, over forty pneumonia patients being treated at the hospital at this time. The past week also had two deaths from meningitis to record, one of which showed generalized infection due to the *Diplococcus intracellularis*. Though both of these cases were brought to treatment promptly, the serum treatment proved of no avail. Owing to the still incomplete state of the laboratory, it has not been possible to make satisfactory bacteriologic examination to determine the particular strain of the meningococcus; therefore it cannot be stated whether the death of these patients must be assigned to the presence of a foreign strain of the meningococcus or whether the serum used was defective.

Thirty-Eighth Division, Camp Shelby, Hattiesburg, Miss.

The medical organization of the Thirty-Eighth Division, which consists of National Guard troops from Indiana, Kentucky and West Virginia, is now almost complete.

The regimental infirmaries are being equipped with a modified Wolfe ward unit which gives a well equipped hospital of twenty beds for each regiment. Hotel ranges are supplied for the kitchens, and heating stoves are being installed.

On Monday and Thursday nights, meetings for all medical officers are held. Monday nights are devoted to medico-military subjects, and Thursday nights to purely professional papers with reports and presentation of clinical cases, of which there are an abundance in the base hospital.

BASE HOSPITAL

The base hospital is complete with the exception of the ceiling of the wards. On account of the present epidemic of measles, it is now crowded to its utmost, and the tentage of three field hospitals has been pitched to care for men with mild cases, thus relieving the congestion of the wards. The ward tents are floored, and have stoves and iron beds. In this camp, experience has proved that measles patients do fully as well under canvas as in buildings.

MEASLES

This camp, as well as many others, is suffering from an epidemic of measles. The disease, however, seems to be of a mild type, often running an afebrile course. There have been only two cases of pneumonia in 500 cases of measles, and no other complications. In an effort to control this epidemic, very strict orders have been issued regarding sanitation of tents, personal hygiene, and physical inspections. Although these orders are well carried out, they seem to have little or no effect on the development of new cases. Climatic conditions, dust and smoke, and the age of troops, together with the arrival of drafted men from other camps, no doubt have much to do with the continuation of the disease.

PNEUMONIA

There have been about sixty cases of pneumonia, principally of the lobar type and running a clear cut typical course. The death rate is low, only about 4 per cent., and the infection does not seem to be of a virulent type. The laboratory work of differentiating the various strains of pneumococci is now under way, and in a short time it will be possible to administer specific serum therapy in suitable cases.

MENINGITIS

During the month of October, six cases of meningitis developed in this command. Four were in one regiment and appeared within three days. The regiment was promptly moved to an isolation camp; rigid quarantine was instituted, and under the direction of a medical officer every man in the organization gargled his throat and douched his nose twice a day with Dobell's solution. As rapidly as possible, members of the companies in which the cases appeared were examined for carriers. When these were found, they were isolated from all others and given intensive treatment with dichloramin-T until negative cultures were secured. This prompt action evidently cut short an epidemic that was reaching alarming proportions. The cases were of moderate severity, with only one death.

PERSONAL

The office of the division surgeon is busy with routine work, special instructions, inspections, etc. Lieut.-Col. Robert M. Blanchard is the division surgeon; Major Larue D. Carter, division sanitary inspector, and Capt. Abraham C. L. Percefull, assistant to the division surgeon.

Colonel Blanchard, Majors Hibbitt and Grant of the sanitary train, and Majors Crawford and Lathrop of the base hospital staff recently returned from the meeting of the Southern Medical Society, held at Memphis, Tenn. It was hoped that Colonel Goodwin of the British Army would give this camp a visit; but it could not be arranged, much to the disappointment of all officers.

Social activities among the medical officers have been curtailed on account of the immense amount of work on hand. All are cheerful and happy, however, and not growing stale in their duties.

Eightieth Division, Camp Lee, Petersburgh, Va.

November 5, the regular course of instruction of medical officers and Medical Department enlisted men was put into effect. The course prescribes thirty-eight hours' work a week, and is being carried out by the sanitary train and regimental detachments. The work of the sanitary train is handicapped because no enlisted men have as yet been available for one ambulance company and three field hospitals.

A most interesting clinic was held at the base hospital on November 22, which was attended by the medical officers of the division and the base hospital. Major Ewing Day, M. R. C., described the functions of the semicircular canals and the various nerve paths leading from the canals to the brain. Major Day also demonstrated the Bárány test on a normal individual and also on a man who had become deaf as a result of cranial injury. Major William L. Peple, M. R. C., gave an illuminating talk on appendicitis, stating that twenty cases had been admitted to the base hospital since its opening and all had been operated on and were doing well. Capt. Joseph B. Sayles, M. R. C., showed an interesting case of pellagra and one of favus.

A regular meeting of the medical officers attached to the division and base hospital is being held weekly on Wednesday afternoons at which administrative affairs are discussed. Thursday evenings a clinical meeting is held at the base hospital.

At the clinical meeting, November 15, Major Ross Moore, M. R. C., chief of the neurologic section of the base hospital, demonstrated a series of cases showing types of mental cases and diseases in the Army. Two neuropsychopaths, one hypochondriac, two dementia praecox patients and two with paranoid personality were shown. The officers were much interested in the clinic, and there was general discussion as to whether any of the men demonstrated should remain in the Army.

NEUROLOGIC EXAMINATIONS IN THE DIVISION

During the last ten days the routine neurologic examination of enlisted men in this division has been begun in earnest. Capt. J. M. W. Scott of Schenectady, N. Y., has been acting as neurologist to the base hospital ever since its opening, two

months ago. About November 1, Lieut. Bennett A. Burks of Alabama, Lieut. Dudley C. Kalloch of Ossining, N. Y., and Major Ross Moore of Los Angeles arrived for the purpose of making this routine examination.

Approximately 20,000 out of the 33,003 troops in camp have already been examined by the psychologists. The final discards from this examination, the mental defectives of such low degree as to be considered unfit for duty by the psychologists, are being studied by Major Moore and his assistants to determine their final disposition.

During the early weeks of psychologic testing, the mental age of 10 years was gradually settled on by Captain Scott and the psychologists as being the lowest average level for Army service. This conclusion was based on studies of companies that were composed to a large extent of American born men of American born parents. Studies made during the last ten days of some companies from western Pennsylvania and West Virginia, composed in large proportion of foreign born men, mostly illiterates, are showing that a mental age of 10 years is too high. Many men have been accepted for the Army who can neither read nor speak English, but who are expert workmen in steel mills, etc., and whose mental age lies between 8 and 10 years. The general conclusion at present, therefore, is that foreign born illiterates of a mental age of 8 years and upward will make good Army material, while 10 years and upward is the low limit for American born illiterates. The differentiation is a very real one, and is graphic evidence of how men differ in their ability to react to surroundings. The many American born illiterates of these examinations have had opportunities for intellectual betterment but have not profited by them or have even retrograded, while many of these foreign born illiterates have had no such advantages but are eager to secure what they can now. In these large group tests the proportion of illiterates included is great enough to make a difference of two years in the age of acceptance between American and foreign born illiterates. This phase of the investigation is still young. Other conclusions may be reached after further study. Another and a larger psychiatric and neurologic study now in process of accomplishment is the study of the enlisted men with a view to the elimination of the unfit. The latter are the pathologic, neuropaths and psychopaths, and the insane. The feebleminded are being inexorably detected by the psychologists, and their final disposition is easily accomplished. The detection of the psychopaths and neuropaths is quite another matter. The plan in use at the present is as follows: Work is done by regiments in regimental infirmaries. The regimental medical officers are asked to hand in the names of men who have been noted as acting queerly in some way, or to be unable to fit themselves into the Army life well enough to get along—men who seem unable to learn the drill, etc.—and all men suspected of malingering. These men are studied individually by the neurologists, the evidence of their company commanders is taken, they are put through drill and other tests, and are often sent to the base hospital neurologic wards for observation. In other cases they are returned to the ranks for two weeks for further training. It is thought that this procedure will ultimately eliminate a large proportion of the neurologically unfit.

HEALTH OF THE DIVISION

The general health of the division remains good although an outbreak of mumps and measles, limited to two regiments has increased the sick rate. There are sixty-four cases of measles and one hundred and thirty-one cases of mumps. There have been twenty cases of pneumonia and only one death, and eight cases of cerebrospinal meningitis with but one death.

VENEREAL DISEASES

Effort is being made to secure a report of every new case of venereal disease whether the man is in hospital, quarters or doing duty. In order to study carefully the work of each infirmary, a weekly report on prophylaxis and venereal disease is rendered by each organization surgeon. The prophylactic treatments given during the week are grouped into those given within an hour, one to two hours, two to four hours, four to eight hours and over eight hours. The number of cases of gonorrhea, chancroid or syphilis which occur in spite of prophylaxis are reported and grouped according to the time the prophylactic treatment was given. Cases that were undoubtedly infected prior to enlistment are classified separately as are also cases that have developed in men who fail to take prophylactic treatment. Prophylaxis stations are maintained in Hopewell, Va., a city of 15,000 people, 6 miles away and in Petersburg, four miles away, a city of 30,000.

By means of the reports it will be possible to learn the proportion of cases occurring in the various commands before and after enlistment, the efficacy of prophylaxis early and late and the extent of immorality, and finally the definite number of cases of syphilis, gonorrhea and chancroid.

Eighty-Fourth Division, Camp Zachary Taylor, Louisville, Ky.

ATHLETIC TRAINING

Compulsory athletic training has been added to the schedule of daily life at Camp Zachary Taylor. Heretofore, the soldiers have spent eight hours a day at drill; now one hour a day at athletics will be substituted for an hour of drill. From 10:30 to 11:30 each day, compulsory athletics on a scientific and systematic basis will be indulged in. There will be physical drill or calisthenics, boxing and wrestling, football, blocking, charging and tackling, obstacle and relay racing, basketball, volley ball, baseball and soccer football. An athletic officer has been appointed in each regiment, separate battalion and independent unit, who are charged with supervision and direction of the physical training, with a Louisville man, Capt. George R. Ewald, as division athletic officer. Eight men are in the hospital because of injuries received in these exercises, two with fractures of the clavicle.

CONSCIENTIOUS OBJECTORS

Sixty members of the Mennonite faith from Illinois sprang a surprise on the division paymaster when they refused to accept their pay. They are conscientious objectors, and are called absolutists, as they object to serving in the Army in any capacity. The only work they are performing is keeping their quarters clean.

MEASLES

Heavy punishment is being meted out by the summary court martial in the Three Hundred and Thirty-Sixth Infantry to men who break the quarantine for measles and go into the city without leave. Three men recently tried in Company D were sentenced to ninety days in the guard house and three months' loss of pay. The epidemic as far as new cases are concerned is about over. One death has occurred from a complicating bronchopneumonia. Each organization has received orders to be prepared to send its men to the base hospital, on request of the division surgeon, for the psychologic examination. Every man in camp will eventually be put through these tests.

AMBULANCE COMPANIES

Ambulance equipment for the Three Hundred and Ninth Sanitary Train has arrived, and this organization will perform the ambulance service for the entire camp. Four companies of the sanitary train are known as ambulance companies; two more motor drawn units, and the other two derive their power from the famous Army mule. Ambulances will call at 9 o'clock each morning and 3 o'clock each afternoon at all regimental infirmaries and transfer patients to the base hospital. Two ambulances are kept on duty at the base hospital day and night.

First Lieut. Lynn T. Hall of Ambulance Company No. 355 has been designated as attending surgeon of the Infantry School of Arms. He will maintain a dressing station near the school, and will have an ambulance ready at all times.

NURSING SERVICE

More Red Cross nurses have reported to Major J. A. Worthington, the nursing staff now numbering thirty-four. A meeting was held on the 19th at the Children's Free Hospital for the purpose of stimulating interest in Red Cross nursing and recruiting for the base hospital at Camp Zachary Taylor. A reception to the Army nurses on duty was held after the meeting. A number of the nurses assigned to Base Hospital No. 40, Lexington, Ky., have asked for transfer to the base hospital at Camp Zachary Taylor pending foreign orders.

REPORTS OF MEDICAL OFFICERS

Several medical officers from the base hospital attended the meeting of the Medico-Chirurgical Society, November 16. Major Hamburger made a brief report of the epidemic of measles that has been so prevalent in two regiments, and now has begun to spread among those attached to the hospital, one nurse, one medical officer in the eye section, and several hospital attendants being affected. The rashes have been almost uniformly severe, a large percentage being hemorrhagic. There have been a number of complicating broncho-

pneumonias, and the marked early cyanosis in these cases has been an outstanding feature. In the fatal cases the necropsy findings in the lung have been uniformly a most diffuse riddling of the lung with patches of bronchopneumonia and a great amount of exudate everywhere.

The seven meningitis patients are doing well under the serum treatment; four are convalescent. The lobar pneumonia patients have progressed well, with a very small percentage of deaths.

Lieutenant Alexander, who has had long training in the laboratory side of pneumonia in Boston, New York and Baltimore, reported that 65 per cent. of the lobar pneumonias have been found due to Types I and II, and that these organisms are not found in normal mouths. The bronchopneumonias are due to a typical Type II, and Types III and IV, and these types are found normally in healthy mouths. On this theory more consistent and regular oral hygiene and antisepsis will be used in the measles cases particularly. A good deal of polyvalent serum has been used, and a shipment of Type I serum has just been received. The cases at Rockefeller Hospital under the specific serum treatment reduced mortality from 30 per cent. to 5. The polyvalent serum is used before the type of organism is known. It is purposed to standardize the various types of serums received from the manufacturers. In the tests some of the serums have been found useless in vitro. It is hoped that all can be standardized.

Major Wilder and Captain Littig of the ophthalmologic staff at the hospital occupied the program of the regular meeting of the ophthalmologic society, on the 15th.

BASE HOSPITAL

The base hospital, now nearly completed in every detail, occupies 85 acres and sixty-seven buildings, with 1,000 beds. Sixty-five physicians, 288 enlisted men and thirty nurses care for the 560 patients now in the hospital.

Eighty-Eighth Division, Camp Dodge, Des Moines, Iowa

An intensive course of training for all medical officers has been outlined by Lieutenant-Colonel Shook, the division surgeon, pursuant to an order from the Surgeon-General. Excellent lectures have already been given by Major Miller on "Foreign Protein Therapy"; Major Ruth on "Treatment of Fractures of Head and Neck of Femur"; Captain Baehr on "War Psychiatry"; Captain Glomset on "Carriers," with special reference to typhoid, diphtheria, epidemic meningitis and pneumonia, and by Major Todd on "Practical Hints to Military Medical Officers on the More Common Diseases and Treatment of the Eye, Ear, Nose and Throat."

The Camp Dodge Medical Society, composed of all the medical officers of this cantonment, has been formed with Major Todd as president. Meetings are being held weekly. Interesting and instructive papers have been given by Contract Surgeon Feil and Captain Franing.

Major John Ridlon was in camp about ten days ago, and gave a series of lectures and demonstrations to medical and line officers.

NEWS NOTES

Col. Charles Dircle of the Medical Department of the French Army and Col. T. H. Goodwin of the British Medical Service visited and inspected this cantonment some time ago. They report that the camp and type of work being done is excellent. Each officer spoke before the meeting of the Polk County Medical Society on that date, and gave some interesting and vivid descriptions of modern warfare.

Major Alexander Cooper of Fort Oglethorpe, Ga., has been assigned as commanding officer of the base hospital.

Major E. O. Craft has been assigned as commanding officer of the base hospital at Presidio, Calif. He was highly commended by the commanding general for his excellent work of organizing and commanding the base hospital at this camp.

Capt. E. C. G. Franing of Galesburg, Ill., has been given detached service at Chicago, to attend the special course on fractures given there.

Capt. L. L. Henniger of Council Bluffs, Iowa, has been transferred to Fort Porter, N. Y.

Lieut. John Voss and M. C. Frazier have been given detached service at Chicago, to attend a special course on oral surgery.

BASE HOSPITAL

The base hospital moved into permanent quarters, October 25 and 26. The new hospital is situated at the northwestern end of the camp, close to the village of Herrold. It is composed of thirty-two buildings, built about a central quadrangle about 100 yards wide and 150 yards long. These buildings are all connected by closed corridors.

Eighty-Ninth Division, Camp Funston, Fort Riley, Kan.

INCLEMENT WEATHER

The weather at this camp was a subject of great disparagement during the latter part of October. It was typical winter weather, accompanied by snow storms, and, as the heating plants were not installed, one often had to go to bed to keep warm. At present we are having beautiful, warm winter days and clear nights, and it is unnecessary to heat the barracks, excepting for a short time each morning.

INSPECTION

Col. W. P. Chamberlain, M. C., and Col. George E. Bushnell, M. C., of the War Department, have just completed a tour of inspection of the camp, and they have expressed themselves favorably regarding the condition of the cantonment. They could hardly believe that the number of new cases of venereal disease contracted by men after coming to this camp was so low. Since the camp was started, there have been but five, and prophylactic treatments have been likewise sparingly called for, although every man in the division has been properly instructed on the subject.

QUARANTINE

With regard to the prevention of disease in this camp, a quarantine has been established between the Ninety-Second and the Eighty-Ninth divisions, and the men from the two do not intermingle, conducting all drills and duties separately. As another step, all of the roads, dirt or macadamized, have been well oiled and rendered dustless.

MENINGITIS

By taking frequent and systematic cultures, a number of meningococcus carriers among the new troops have been apprehended and isolated, and as a result few new cases of meningitis are expected.

Ninety-First Division, Camp Lewis, American Lake, Wash.

The cantonment at Camp Lewis is on a prairie 16 miles southwest of Tacoma; it is 2¾ miles long by 1 mile wide. The soil is composed of much small rock and gravel, and the drainage is excellent. Construction was started, June 20, 1917, and completed, according to the original plan, September 15. There are 1,600 buildings all told on the ground, 35 miles of water pipe, and 35 miles of sewer line. Lieut.-Col. Peter C. Field, M. C., is division surgeon, Lieut.-Col. Lloyd L. Smith, M. C., division sanitary inspector, and Major Eugene G. Northington, M. C., commanding officer, of the base hospital. The remaining medical officers belong to the Medical Reserve Corps, and hail from all parts of the West and particularly from the Northwest. There are 166 medical officers, 20 contract surgeons, 38 dental officers and 15 veterinarians.

The sanitary condition of this camp is excellent. Very few cases of acute contagious diseases have appeared. The prevailing diseases are those of the upper respiratory tract: bronchitis, tonsillitis and pharyngitis.

The following officers are in charge of the different services of the base hospital: Major Eugene G. Northington, M. C., commanding officer; Major Herbert M. Greene, M. R. C., adjutant; Major Calvin S. White, M. R. C., chief of the medical service; Major John J. Kyle, M. R. C., chief of the ophthalmic division; Capt. Ernest L. Bickford, M. R. C., chief of the laboratory service; Capt. Edward A. Rich, M. R. C., chief of the orthopedic service; First Lieut. Horace J. Whitacre, chief of the surgical service, and Capt. Rawlins Cadwallader, M. R. C., post exchange and mess.

The operating room and roentgen-ray room are completed in every detail and are running in smooth order. The hospital is fully equipped throughout with steam heat and electric lights. There are now attached to the hospital, 40 medical officers, 30 female nurses and 240 hospital corps men. The base hospital and sanitary train occupy about 40 acres.

Nearly all cases of venereal diseases were contracted before the men arrived at camp. Only two new cases have been reported. Practically the entire command is vaccinated against smallpox; typhoid and paratyphoid prophylaxis has been given. All new men are marched from the train to the receiving tent, where they are carefully examined for contagious and venereal diseases.

ORDERS TO OFFICERS OF THE MEDICAL CORPS

To Camp Beauregard, for duty, Lieut. ERNEST E. ALLGEYER, New Orleans.

To Camp Sheridan, base hospital, from Plattsburg Barracks, Capt. GEORGE W. JEAN.

To Camp Mills, as inspector instructor of sanitary personnel and on completion to return to his proper station, Major CONDON C. McCORMACK.

Col. GEORGE E. BUSHNELL, to the following named camps to inspect the work of tuberculosis examiners and on completion to his proper station, *Camp Beauregard, Camp Pike, Camp Funston, Denver, Colo., Camp Dodge, Camp Grant.*

Major EDGAR KING, to the following named places for duty in connection with the development of special hospitals, and on completion to his proper station, *Long Beach, Asbury Park.*

Major EDGAR D. CRAFT, *to San Francisco*, Letterman General Hospital for duty, from Camp Dodge.

Lieut.-Col. CHARLES F. CRAIG, to be relieved from duty at the dept. laboratory, Fort Leavenworth, Kan., and to the following camps to inspect the Public Health Laboratory work, and on completion to proper station: *Camp Dodge, Camp Grant, Camp Custer, Camp Sherman, Camp Taylor, Camp Funston.*

Col. BASIL H. DUTCHER, be relieved from duty in the Panama Canal Dept. and *to Washington, D. C.*, to report in person to the Surgeon-General for duty.

Col. HENRY C. FISHER, to the following named places to make sanitary inspections, and on completion to his proper station, *Camp Wheeler, Camp Beauregard, Camp Shelby, Camp Jackson, Camp Sevier.*

Col. DAVID BAKER, relieved from duty at El Paso, Tex., and *to Camp Sheridan* for duty in command of the base hospital.

Lieut. GEORGE W. BELLER, relieved at Fort Casey, Washington, and *to Seattle*, for duty as medical member of examining board and recruiting officer.

Lieut.-Col. WILL L. PYLES, relieved at Fort Niagara, N. Y., and to the following named places to inspect buildings and sites under consideration for use as hospitals, and on completion to his proper station, *Rochester, N. Y., Dansville, N. Y., Avon, N. Y.*

Major LEARTUS J. OWEN, relieved at Letterman General Hospital, San Francisco, Calif., and assigned *to station in Washington, D. C.*

Lieut.-Col. WILLIAM R. MONCRIEF, *to New York* for duty, and on completion to his proper station.

Major WILLIAM E. HALL, relieved in the Panama Canal Dept. *to Governors Island, N. Y.*, for duty.

Lieut. EDWARD A. COATES, JR., relieved at Fort Des Moines, Ia., and *to Fort Riley* for duty.

Lieut.-Col. JOHN R. BOSLEY, relieved at Fort Ontario, N. Y., and *to Hot Springs, Ark.*, for observation and treatment.

Major WILLIAM H. TEFFT, *to president of examining board, Fort Riley*, for examination for promotion, from Fort Riley.

Major WILLIAM L. HART, *to Baltimore, Md.*, to inspect the Maryland State Hospital Train, and on completion to return to his proper station.

ORDERS TO OFFICERS OF THE MEDICAL RESERVE CORPS

Alabama

To Annapolis Junction, Md., from Camp Wheeler, Lieut. WILLIAM M. PIERCE, Tuscumbia.

To Camp Beauregard, as a member of board for special examination of command for tuberculosis, Lieut. FLOYD L. ABERNETHY, Flomaton.

To Fort Logan H. Roots, Ark., for duty, from Fort Oglethorpe, Lieut. CLAUDE C. McLEAN, Birmingham.

To Fort Oglethorpe, for duty, from Camp McClellan, Lieut. WILLIAM W. BURNS, Selma.

To Fort Riley, Kan., for instruction, Lieut. DUKE C. BRADFORD, Birmingham.

To New York City, Neurological Institute, for intensive training in brain surgery, from Camp Greenleaf, Lieut. FRANCIS M. INGE, Mobile.

To Springfield, Mass., for duty, from Fort Benjamin Harrison, Lieut. HENRY BOXER, Birmingham.

Arkansas

To Camp Dodge, for examination of command for tuberculosis, from Fort Benjamin Harrison, Capt. PERRY C. WILLIAMS, Texarkana.

To Camp Joseph E. Johnston, for duty, from Fort Oglethorpe, Lieut. ERTON E. POYNOR, Green Forest.

To Fort Oglethorpe, for duty with Evacuation Hospital, No. 5, Lieut. MAHLON D. OGDEN, Little Rock.

To Fort Riley, Kan., for instruction, Lieut. CAP J. CARTER, Sherrill.

To Washington, D. C., Government Hospital for the Insane, for special training, from Surgeon-General's office, Capt. EDWIN P. BLEDSOE, Little Rock.

To his home and honorably discharged on account of being physically disqualified for active service from Camp Greenleaf, Lieut. TRUE S. BURGESS, Russellville.

California

To Camp Doniphan, base hospital, from Jefferson Barracks, Capt. CARO W. LIPMAN, San Francisco.

To Camp Fremont, Palo Alto, Calif., Base Hospital No. 47, Capt. HAROLD SIDEBOTHAM, Santa Barbara.

To Camp Lewis, Tacoma, Wash., for duty, Lieut. FREDERICK A. COLLER, Los Angeles.

To San Francisco, Calif., for duty examining troops for tuberculosis, from Camp Kearney, Capts. JOSEPH A. PARKE, San Diego; WILLIAM R. P. CLARK, JAMES L. WHITNEY, San Francisco.

To New York City, Neurological Institute, for intensive training in brain surgery, from Camp Lewis, American Lake, Wash., Major ALANSON WEEKS, San Francisco.

Canal Zone

To Army Medical School, Washington, D. C., for instruction, Lieut. WILLIAM B. FOSTER, JR., Ancon.

Colorado

To Boston, Mass., for duty, from Camp Lewis, American Lake, Wash., Major WALTER A. JAYNE, Denver.

To Camp Sherman, as member of board for special examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. ORION A. GRANTHAM, Johnstown.

To his home and the inactive list of the Medical Reserve Corps, Lieut. JAMES R. ARNEILL, Denver.

Connecticut

To Camp Sherman, as member of board for special examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. EDWIN S. BENNETT, New Canaan.

To Newport News, for duty, Lieut. LLOYD L. NAURER, New Haven.

To New York City, Neurological Institute, for intensive training in brain surgery, from Camp Upton, Major WILLIAM F. VERDI, New Haven.

District of Columbia

To Camp Jackson, base hospital, Lieut. HENRY MAYES, Washington.

To Fort Myer, Va., for duty with the Twelfth Field Artillery, Major CHARLES L. G. ANDERSON, Washington.

To Fort Riley, for duty with Evacuation Hospital No. 7, from Fort Oglethorpe, Capt. THOMAS W. O'REILLY, Washington.

Florida

To Camp Hancock, base hospital, from Camp Greenleaf, Lieut. ROBERT E. BALDWIN, Tampa.

To Fort Oglethorpe, for duty, from Camp Wheeler, Lieut. HENDLY F. HORNE, Jacksonville.

To Fort Riley, for duty, from Fort Des Moines, Capt. MORETON H. AXLINE, St. Petersburg; Lieut. CHARLES L. KENNON, Jacksonville.

To Tenafly, N. J., base hospital, from Camp Wheeler, Lieut. WILLIAM H. G. MacKAY, Jacksonville.

To Washington, D. C., American University, for duty, from Camp Greenleaf, Capt. FREDERICK C. MOOR, Tallahassee.

To the inactive list on account of being physically disqualified for active service, from Fort Oglethorpe, Lieut. HEBER P. NEWMAN, Bartam.

Georgia

To Atlanta, Ga., dept. laboratory, from Rockefeller Institute, Lieut. ALLEN H. BUNCE, Atlanta.

To Camp Gordon, base hospital, from Camp Wheeler, Lieut. FRED B. RAWLINGS, Sandersville.

To Fort Oglethorpe, for duty, from Walter Reed General Hospital, Capt. THOMAS C. DAVISON, Atlanta; from Camp Wheeler, Lieut. JOHN TERRELL, JR., Canon; from Chickamauga Park, Lieut. EGBERT M. TOWNSEND, Tilton.

To Fort Porter, N. Y., United States Army General Hospital No. 4, for duty with Hospital Unit "A", Lieut. WALTER E. HOLMES, JR., Macon.

To New York City, Post-Graduate Medical School and Hospital for instruction in urology and dermatology, Capt. JOHN M. SIGMAN, Macon.

To Rockefeller Institute, for instruction, and on completion of this course to return to his proper station, from Fort Oglethorpe, Capt. GEORGE A. TRAYLOR, Augusta, and on completion of this course to Atlanta, Ga.; dept. laboratory, Lieut. ALLEN H. BUNCE, Atlanta.

To be honorably discharged on account of being physically disqualified for active service, from Fort Des Moines, Lieut. GEORGE W. P. JOHNSON, Savannah.

Idaho

To Camp Funston, for duty, from Fort Riley, Lieut. ROBERT S. KNEESHAW, St. Maries.

To Fort Omaha, Neb., United States Army Balloon School, for duty, Capt. FRANCIS H. POOLE, Pocatello.

Illinois

To Army Medical School, Washington, for duty, Lieut. CARL W. CLARK, Chicago.

To Boston, Mass., for instruction in orthopedic surgery, from Camp Grant, Lieut. CLARENCE A. JACOBSON, Chicago, from Fort Oglethorpe, Lieut. TORRANCE REED, Chicago.

To Camp American University, for duty, from Fort Benjamin Harrison, Lieut. FREDERICK E. ROBERG, Joliet.

To Camp Bowie, base hospital, from Rockefeller Institute, Capt. FREDERICK LUDWIG, Great Lakes.

To Camp Dodge, for duty, from Fort Riley, Lieuts. CHARLES A. CIBELIUS, FREDERICK G. TEST, Chicago; for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. TIMOTHY C. WEBER, West Salem.

To Camp Doniphan, base hospital, from Fort Riley, Lieut. JOHN M. KRASA, Chicago.

To Camp Funston, for duty, from Fort Riley, Capt. WILFRED H. GARDNER, Bloomington; for examination of command for tuberculosis, from Fort Benjamin Harrison, Capt. CHARLES H. POWELL, Old Ripley; Lieut. CLARENCE W. CHAPIN, Weldon.

To Camp Grant, base hospital, from Fort Benjamin Harrison, Lieuts. BENJAMIN F. ZOBRIST, Camargo; LORAN E. ORR, Petersburg; as member of board for examination of command for tuberculosis, from Camp Bowie, Lieut. ROBERT S. BERGHOFF, Chicago.

To Camp Greenleaf, for duty, from Fort Benjamin Harrison, Lieuts. HERBERT G. HEMPLER, Creal Springs; RALPH E. POTTER, Loraine; for duty from Fort Morgan, Lieut. FREDERICK T. RICE, Chicago.

To Camp Lee, for duty, from Fort Oglethorpe, Lieuts. HULITT J. WYCKOFF, Chicago; from Philadelphia General Hospital, WILSON K. DYER, Kankakee.

To Camp Logan, base hospital, from Fort Benjamin Harrison, Lieut. ARTHUR B. CONNOR, Wheaton.

To Camp McArthur, base hospital, Lieut. EUGENE Y. YOUNG, Mansfield.

To Camp McClellan, for temporary duty, from Evans Dental Institute, Philadelphia, Pa., Lieut. WILLIAM H. MALEY, Galesburg.

To Camp Pike, Little Rock, base hospital, from Fort Benjamin Harrison, Lieut. ROBERT B. MILLER, Rock Island.

To Camp Sherman, for temporary duty from Evans Dental Institute, Philadelphia, Pa., Lieut. RALPH E. KLECKNER, Mattoon.

To Camp Taylor, for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. WILLIAM S. NEEDHAM, Hanna City.

To Camp Upton, base hospital, from Fort Benjamin Harrison, Lieut. CLYDE F. BACCUS, Woodstock.

To Chicago, Ill., for instruction and on completion to return to Fort Sheridan for duty, from Fort Sheridan, Lieut. WILLIAM A. CLARK, Chicago.

To Fort Oglethorpe, for duty, from Camp Dix, Lieut. EVERETT P. COLEMAN, Canton.

To Fort Riley, for instruction, Lieut. ROBERT S. WISHARD, Wheeler; for duty, from Fort Des Moines, Lieut. LEE C. GATEWOOD, Chicago; for duty with Evacuation Hospital No. 7, from Plattsburg Barracks, Lieut. JAMES H. VETTER, Chicago; from Washington University, St. Louis, Mo., Lieut. EDWIN W. HIRSCH, Chicago.

To New York City, Neurological Institute, for intensive training in brain surgery, from Camp Pike, Capt. WILLIAM FULLER, Chicago.

To Portland, Ore., for instructions and assignment to squadrons now being organized, from Fort Worth, Tex., Lieut. JOEL E. TOOTHAKER, Ladd.

To Richmond, Va., for duty, from Fort Benjamin Harrison, Lieut. RALPH R. TRUEBLOOD, Lawrenceville.

To Rochester, Minn., for instruction and on completion of course to Camp Beauregard, from Fort Benjamin Harrison, Lieut. THOMAS R. KELLY, Du Quoin; on completion to Camp McClellan, Lieut. WILLIAM L. MENG, Belleville; on completion to Camp Sherman, Lieut. RAYMOND M. Kelly, Chicago; on completion to Fort Sheridan, Lieut. LUTHER B. HIGHSMITH, Flat Rock.

To Rockefeller Institute, for instruction and on completion of course to Roosevelt Hospital, for a further course of instruction, and on completion of course to Fort Logan for temporary duty, from Fort Benjamin Harrison, Capt. VERNON C. DAVID, Chicago.

To his home and honorably discharged on account of being physically disqualified for active service, Lieut. EDWARD E. EDMONDSON, Mt. Vernon; from Fort Benjamin Harrison, Lieut. EARL R. COCHRAN, Rockton.

Indiana

To Camp Dodge, for duty, from Fort Benjamin Harrison, Capt. HARRY B. WILLIAMS, Mace.

To Camp Grant, base hospital, from Fort Benjamin Harrison, Lieut. WARREN W. HEWINS, Evansville.

To Camp Lee, for duty, from Philadelphia, Pa., Capt. ALFRED P. ROOPE, Columbus.

To Camp Meade, for duty, from Fort Benjamin Harrison, Lieut. JAMES O. RHEA, Linden.

To Camp Shelby, for duty, Lieut. IVAN E. BRENNER, Winchester.

To Camp Sheridan, for duty, from Camp Pike, Capt. Allen Hamilton, Fort Wayne.

To Camp Sheridan, as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. AMZI W. HON, Indianapolis.

To Camp Travis, for duty, Lieut. GEORGE L. MARSHALL, Bourbon.

To Camp Wheeler, for duty, from Fort Benjamin Harrison, Capt. JAMES W. DUCKWORTH, Indianapolis; Lieut. JOHN W. PAHMEIER, Indian Springs.

To Fort Oglethorpe, for duty, from Camp American University, Lieuts. LLOYD A. ELLIOT, Elkhart; from Fort McClellan, Lieut. ELMER C. SINGER, Fort Wayne.

To Fort Omaha, Neb., for duty with balloon squadrons for overseas, from Fort Benjamin Harrison, Lieuts. FREDERICK L. DARROW, East Haven; CHARLES R. ELFERS, New Augusta.

To Honolulu, Hawaii, for duty, from Fort Benjamin Harrison, Lieuts. JAMES H. JOHNSON, Connersville; EUPY K. SCHURTZ, Waterloo.

To New York City, Neurological Institute, for intensive training in brain surgery, Capt. THOMAS M. JONES, Anderson; to Post Graduate Hospital for instruction in urology and dermatology, Lieut. ASHTON M. BALDWIN, Marion.

To Portland, Ore., for instructions and assignment to squadrons now being organized from Fort Worth, Tex., Lieut. CARLOS C. ROZELLE, LeGrange.

To Rochester, Minn., for instruction and on completion of course, to Camp Sevier, Lieut. LLOYD H. SIMMONS, Millersburg.

To Tenafly, N. J., for duty in Ice Plant Company, No. 301, from Fort Benjamin Harrison, Lieut. CHARLES W. ASHLEY, Bicknell.

Honorably discharged on account of being physically disqualified for active service, Major ORANGE G. PFAFF, Indianapolis.

Honorably discharged from Camp Custer, Lieut. GARLAND D. SCOTT, Sullivan.

Iowa

To Boston, Mass., for orthopedic instruction, from Camp Greenleaf, Lieut. GARNETT S. FELT, New Providence; from Fort Snelling, Lieut. EDWARD S. PARKER, Idagrove.

To Camp Custer, base hospital, from Fort Benjamin Harrison, Lieut. WILLIAM H. BETTS, Madrid.

To Camp Dodge, Des Moines, Ia., for duty, from Fort Des Moines, Capt. HANS HANSEN, Logan.

To Camp Sherman, Chillicothe, Ohio, Eighty-Third Division as member of board for examination of command for tuberculosis, from Camp Greenleaf, Lieut. HARRY C. NICHOLS, Carson.

To Camp Upton, Yaphank, L. I., N. Y., for temporary duty, base hospital, Lieut. HAROLD L. BRERETON, Emmetsburg.

To Fort Logan H. Roots, Ark., for duty, from Fort Benjamin Harrison, Lieut. ORSON A. KELLOGG, Dows.

To Fort Riley, Kan., for instruction, from Camp Dodge, Capt. JAMES J. DALY, Decorah.

To New York City, from Philadelphia, for duty in connection with the physical examining unit, and on completion to proper station, Major SUGEN R. LEWIS, Dubuque.

To New York City, Neurological Institute, for intensive training in brain surgery, Capt. HENRY A. GRAY, Keokuk; from Fort Riley, Lieut. FREDERICK W. SALLANDER, Fort Madison; to report to the chief surgeon, aviation section, for temporary duty, and on completion to Camp Dix, L. I., from Fort Benjamin Harrison, Lieut. VICTOR E. BOLLINGER, Mt. Pleasant.

To his home and the inactive list on account of being physically disqualified for active service, from Camp Dodge, Lieut. ROBERT C. MOLISON, Marshalltown.

Kansas

To Camp Devens, Ayer, Mass., for temporary duty, from Evans Dental Institute, Philadelphia, Lieut. IVAN R. BURKET, Winfield.

To Camp Jackson, Eighty-First Division, Columbia, S. C., for duty, from Fort Riley, Kan., Major JOHN E. HEWITT, Wakefield.

To Camp Mills, Garden City, L. I., N. Y., from Gas Defense School, Fort Sill, Okla., Capt. GEORGE W. LEE, Yates Center.

To Fort Riley, Kan., base hospital, for duty, from Medical Officers Training Camp, Fort Riley, Lieut. CHARLES V. HAGGMAN, Scandia.

To New York City, Cornell Medical College, for instruction in military roentgenology, Lieut. GEORGE E. KNAPPENBERGER, Mankato.

To Rock Island, for duty, from Fort Riley, Lieut. RALPH C. HENDERSON, Erie.

To his home and the inactive list on account of being physically disqualified for active service, Lieut. JAMES B. DONNELL, Kinsley.

Kentucky

To Camp Lee, Petersburg, Va., base hospital, from Camp Greenleaf, Lieut. JAMES M. TAULBEE, Lexington.

To Camp Meade, Annapolis Junction, Md., for duty, from Camp Meade, Lieut. MORTON M. MOSS, Bowling Green.

To Camp Shelby, Hattiesburg, Miss., for duty, from Camp Wheeler, Lieut. JOHN P. WHEELER, Carrollton.

To Camp Sheridan, Ala., for temporary duty, from Evans Dental Institute, Philadelphia, Lieut. FREDERICK L. KOONTZ, Louisville.

To Camp Sherman, Chillicothe, Ohio, for duty, from Fort Benjamin Harrison, Lieut. HENRY H. DUKE, Louisville.

To Camp Taylor, Louisville, Ky., as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. EDWIN W. MONTGOMERY, Vince Grove.

To Fort Oglethorpe, for duty, from Camp Wheeler, Lieut. JOHN P. WHEELER, Carrollton.

To Fort Ontario, N. Y., for duty with Field Hospital No. 28, from Camp Devens, Lieut. ARTHUR W. ALLEN, Somerset.

To Honolulu, Hawaii, for duty, from Gas Defense School, Fort Sill, Okla., Capt. SAM F. PARKER, Somerset.

To Morrison, Va., for duty, from Fort Benjamin Harrison, Lieut. UREY G. DAVIS, Hopkinsville.

To New York City, Neurological Institute, for intensive training in brain surgery, Capt. CHARLES FARMER, Louisville.

To Rochester, Minn., for instruction and on completion of course to Fort Oglethorpe, base hospital, from Fort Benjamin Harrison, Lieut. CLIFFORD E. HARKEY, Paducah.

Louisiana

To Camp Beauregard, Alexandria, La., for duty, from Camp Wheeler, Lieuts. WILLIAM T. McNEESE, Angie; Lieut. FREDERICK L. FENNO, New Orleans, as member of board for examination of command for tuberculosis, Lieut. GEORGE H. UPTON, New Orleans.

To Camp Upton, Yaphank, L. I., N. Y., base hospital, from Rockefeller Institute, Lieut. PAUL K. RAND, Alexandria.

To Fort Leavenworth, Kan., for duty, from Camp Wheeler, Lieut. WILEY R. BUFFINGTON, New Orleans.

To Fort Riley, Kan., for duty with Evacuation Hospital No. 7, from Fort Oglethorpe, Lieuts. DOLLIE O. SHERMAN, Clarke; ROBERT P. McGOWAN, New Orleans.

To New York City, Neurological Institute, for training in brain surgery, Capt. WILLIAM M. PERKINS, New Orleans.

Maine

To Boston, Mass., for instruction in orthopedic surgery, from Camp Upton, Lieut. RAYMOND V. N. BLISS, Bangor.

To Camp Sherman, Chillicothe, Ohio, as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. SUMNER C. PATTEE, Searsport.

To Fort McPherson, Ga., base hospital, from Fort Benjamin Harrison, Lieut. CHARLES D. McDONALD, Portland.

To Fort Oglethorpe, for duty, from Camp Devens, Major WILLIAM L. COUSINS, Portland.

To Rockefeller Institute, for instruction, and on completion of course to United States Army General Hospital No. 1, for temporary duty, Lieut. ROYCE V. JOSSELYN, Portland.

Maryland

To Army Medical Museum in connection with supplying illustrations for lecture work, Major ROBERT T. TAYLOR, Baltimore.

To Camp Greene, Charlotte, N. C., base hospital, from Camp Wheeler, Lieut. ALEXANDER McC. STEVENS, Easton.

To Camp Lee, Petersburg, Va., base hospital, from Fort Myer, Lieut. HENRY L. SMITH, Baltimore.

To Camp McClellan, Anniston, Ala., for duty, from Fort Oglethorpe, Lieut. FRANK B. HINES, Chestertown.

To Camp Meade, Annapolis Junction, Md., base hospital, Lieut. HOWARD H. WARNER, Baltimore.

To Camp Sherman, Chillicothe Ohio, base hospital, from Fort Des Moines, Major FRANK MARTIN, Baltimore.

To Fort McHenry, Md., for duty in the United States Army General Hospital No. 2, from Rockefeller Institute, Lieut. JOHN F. LUTZ, Baltimore.

To Fort Oglethorpe, Ga., for instruction, Lieut. FRANK L. JENNINGS, Baltimore.

To Fort Porter, N. Y., for duty, from St. Elizabeth's Hospital, Washington, D. C., Capt. DANIEL C. V. STUART, JR., Baltimore.

To Fort Riley, Kan., for duty with Evacuation Hospital No. 7, from Camp Sheridan, Major DON P. PETERS, Baltimore.

To New York City, Neurological Institute, for training in brain surgery, from Fort Oglethorpe, Lieut. GEORGE W. BISHOP, Govaris.

To Rockefeller Institute, for instruction, from Fort Oglethorpe, Lieut. CLAUDE D. HAMILTON, Sykesville.

To Walter Reed General Hospital, Takoma Park, D. C., for instruction in tuberculosis examinations, Lieuts. ISRAEL J. FEINGLES, Baltimore; SAMUEL NEWMAN, Baltimore.

To his home and the inactive list on account of being physically disqualified for active service, from Hoboken, N. J., Lieut. JAMES A. ETHERIDGE, Baltimore.

To his home and honorably discharged on account of being physically disqualified for active service, from Camp Sevier, Greenville, S. C., Lieut. GEORGE McLEAN, Baltimore.

Massachusetts

To Army Medical School, for duty, Lieut. WILLIAM F. GREANEY, Holyoke.

To Boston, Mass., for duty from Fort Benjamin Harrison, Major WILLIAM COGSWELL, Haverhill; *to Boston City Hospital* for instruction and on completion to Camp Meade, base hospital, Capt. GEORGE C. PARCHER, Sangus Center; for instruction and on completion to Camp Devens, base hospital, Lieut. DAVID D. SCANNELL, Boston.

To Camp Devens, for duty as president of the tuberculosis board, Major JOSEPH H. PRATT, Boston; for duty, Lieut. ANDREW NICHOLS, Boston.

To Camp Dodge, for examination of command for tuberculosis, Lieut. ROGER W. SCHOFIELD, Worcester.

To Camp Gordon, Atlanta, Ga., as member of board for examination of command for tuberculosis, from Walter Reed General Hospital, Capt. FRANCIS R. BURKE, Quincy.

To Chickamauga Park, Ga., for duty with the 110th cavalry, from Camp Devens, Lieut. ABRAHAM K. YOOSUF, Worcester .

To Fort Oglethorpe, Ga., base hospital, from Fort Benjamin Harrison, Capt. PEER P. JOHNSON, Beverly; from Camp Devens, Capt. ISAAC S. F. DODD, Pittsfield; Lieut. ROBERT L. JONES, Lowell; from Fort Banks, Lieut. WALTER M. GRANDALL, Lawrence.

To Fort Sam Houston, Texas, for duty in the department laboratory, from Rockefeller Institute, Lieut. GEORGE H. BIGELOW, Boston.

To Camp Travis, Fort Sam Houston, Tex., base hospital, Lieut. DAVID M. HASSMAN, Boston.

To New York City, Post-Graduate Hospital, for instruction in urology and dermatology, Lieuts. OSCAR F. COX, JR., JAMES H. GETTINGS, Boston; *to Rockefeller Institute,* for instruction in laboratory work, Lieut. DAVID L. BELDING, Boston.

To be honorably discharged, Capt. CADIE PHIPPS, Boston.

To the inactive list from Evans Dental School, Philadelphia, Capt. RALPH C. WIGGIN, Cambridge.

Michigan

To Camp Alfred Vale, Little Silver, N. J., for duty, from Fort Benjamin Harrison, Lieut. JOSEPH L. DES ROSIERS, Detroit.

To Camp Beauregard, Alexandria, La., base hospital, Lieut. JACK R. BOLASNY, Detroit.

To Camp Custer, Battle Creek, Mich., for temporary duty, from Evans Dental Institute, Capt. RALPH E. BALCH, Kalamazoo.

To Camp Dodge, for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. WILBUR A. GRIFFITH, Coldwater.

To Camp Gordon, Altanta, Ga., for temporary duty, from Evans Dental Institute, Philadelphia, Lieut BERNHARD FRIEDLAENDER, Saginaw.

To Camp McClellan, Anniston, Ala., for duty, from Philadelphia General Hospital, Lieut. ARTHUR R. TEMME, Detroit.

To Fort Oglethorpe, Ga., for duty, from Fort Benjamin Harrison, Lieut. FREDERICK S. BAIRD, Bay City.

To Fort Omaha, Neb., for duty, from Fort Benjamin Harrison, Lieut. WAYNE R. BEARDSLEY, Jones.

To Fort Riley, Kan., for duty, from Fort Des Moines, Iowa, Capt. WARREN P. MORRILL, Benton Harbor; from Fort Riley, Lieut. EDWARD P. WAID, Salem; for duty with Evacuation Hospital No. 7, from Fort Benjamin Harrison, Lieut. ALBERT V. BRADEN, Ishpeming.

To Fort Sheridan, Ill., for temporary duty, from Fort Benjamin Harrison, Lieut. JAMES RHINES, Laurium.

To Mineola, L. I., N. Y., Hazelhurst Field, for duty, from Syracuse, N. Y., Lieut. WARD F. SEELEY, Detroit.

To Rochester, Minn., for instruction, and on completion to Camp Green, base hospital, from Fort Benjamin Harrison, Lieut. KENDALL B. REES, Bedford.

Minnesota

To Camp Bowie, Fort Worth, Tex., base hospital, Lieut. ALEXANDER JOSEWICH, Minneapolis.

To Fort Logan H. Roots, Ark., for duty, from Fort Screvon, Ga., Lieut. JOHN H. SCHROEDER, Minneapolis; from Fort Riley, Lieut. JOHN B. CLAIR, Winsted.

To Fort Oglethorpe, Ga., for duty, from Fort Sheridan, Lieut. GEORGE D. RICE, St. Cloud.

To Fort Riley, Kan., for duty, from Camp Funston, Lieut. HENRY E. DOUGLAS, Hutchinson.

To New York City, Cornell Medical College, for instruction in military roentgenology, Lieut. DOUGLAS F. ROBBINS, Minneapolis.

To Portland, Ore., for instructions and assignment to squadrons now being organized, from Fort Worth, Tex., Capt. JOHN C. STALEY, St. Paul.

To Rochester, Minn., for instruction, and on completion of course to Camp Dodge, base hospital, Lieut. ERWIN C. FITZ, Truman.

Mississippi

To Camp Meade, Annapolis Junction, Md., from Camp Wheeler, Lieut. TIMOTHY D. WELCH, Ellisville.

To Fort Leavenworth, Kan., for duty, from Camp Wheeler, Lieut. EUGENE R. SHURLEY, Stover.

To Fort Oglethorpe, for duty, from Camp Wheeler, Lieut. ARMON F. WICKS, Okolona.

Missouri

To Camp Funston, Fort Riley, Kan., for examination of command for tuberculosis, from Fort Benjamin Harrison, Capt. EDWARD H. JOHNSON, St. Louis.

To Camp MacArthur, base hospital, from Fort Riley, Lieut. JOHN H. ARMSTRONG, St. Louis.

To Camp McClellan, Anniston, Ala., for duty, from Phipps Clinics, Baltimore, Lieut. CHARLES H. BURDICK, St. Louis.

To Camp Sherman, Chillicothe, Ohio, base hospital, from Fort Benjamin Harrison, Lieut. FRANK M. SHAFER, Osburn.

To Camp Wadsworth, Spartanburg, S. C., for duty, from Philadelphia General Hospital, Lieut. JAMES LEWALD, St. Louis.

To Fort Oglethorpe, Ga., for duty, from Mineola, Lieut. CLYDE O. BROWN, St. Louis.

To Fort Riley, Kan., base hospital, from Rockefeller Institute, Lieut. PAUL M. KRALL, Kansas City.

To Pittsburgh, for instruction in military roentgenology, from Fort Logan H. Roots, Ark., Lieut. JAMES E. DEWEY, Springfield.

Montana

To Fort Riley, Kan., for instruction, Lieut. GEORGE E. LOW, Round Up; for duty with Evacuation Hospital No. 7, from Fort Oglethorpe, Lieut. HOUSTON H. PARSONS, Sidney.

Nebraska

To Camp Funston, Fort Riley, Kan., for duty, from Fort Riley, Lieut. CLARENCE MOLSEED, Omaha; JESSE C. PAINTER, Schuyler.

To Fort Omaha, Neb., aviation section, signal school, for duty, Lieut. FRANK W. SCOTT, Lodgepole.

To Rock Island, for duty, from Fort Riley, Lieut. ELBER E. CONE, Oxford.

New Hampshire

To Camp McClellan, Anniston, Ala., base hospital, from Fort Benjamin Harrison, Lieut. WILLIAM C. E. NOBLES, Littleton.

To Camp Sherman, Chillicothe, Ohio, as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. FRANK B. FOSTER, Peterboro.

To Fort Clarke, Texas, for duty with the sanitary train, from Fort Benjamin Harrison, Major GEORGE V. FISKE, Manchester.

To Fort Logan H. Roots, for duty in the United States Army General Hospital, from Camp Beauregard, Capt. GEORGE M. WATSON, Manchester.

To Garden City, L. I., camp hospital, Capt. CHARLES A. LAMSON, New London.

New Jersey

To Camp Dix, Wrightstown, N. J., for duty, from Fort Benjamin Harrison, Capt. ANDREW F. McBRIDE, Paterson; Lieut. LANCELET ELY, Somerville.

To Camp Funston, Fort Riley Kan., for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. CHARLES ENGLANDER, Cedar Grove.

To Camp Greenleaf, Fort Oglethorpe, Ga., for duty with Evacuation Hospital No. 6, from Camp Sevier, Lieut. GEORGE BLACKBURNE, Newark.

To Camp Lee, Petersburg, Va., as member of board for examination of command for tuberculosis, Capt. MAURICE ASHER, Newark.

To Camp McClellan, Anniston, Ala., for duty, from Camp Wheeler, Lieut. WILLIAM JAMES, German Valley.

To Camp Meade, Annapolis Junction, Md., for duty, from Neurological Institute, N. Y., Lieut. JAMES P. SANDS, Trenton.

To Camp Sherman, Chillicothe, Ohio, base hospital, from Fort Benjamin Harrison, Lieut. NATHAN FURST, Newark.

To Fort Logan H. Roots, Ark., for duty in hospital, from Fort Benjamin Harrison, Lieuts. EDMUND W. ILL, Newark; JAMES G. DONNELLY, Paterson.

To Fort McPherson, Ga., for duty, Lieut. PHILIP E. BRUNDAGE, Grantwood.

To Fort Oglethorpe, for duty, from Fort Wadsworth, Lieut. GEORGE W. VANNATTA, East Orange; from Camp Wheeler, Lieut. ARTHUR H. TEMPLE, Passaic.

To Chicago, Ill., University of Chicago, for a two weeks' course of instruction in the treatment of pneumonia, and on completion to his proper position, from Camp Sherman, Lieut. HAROLD I. GOSLINE, Trenton.

To Honolulu, Hawaii, for duty, from Gas Defense School, Fort Sill, Okla., Lieut. IRVING E. CHARLESWORTH, Bridgeton.

To New York City, Neurologic Institute, for training in brain surgery, from Camp Greenleaf, Lieut. AARON G. BALDWIN, Newark; *to New York Post Graduate Hospital* for instruction in urology and dermatology, Lieut. CHARLES P. LINGLE, Arlington.

To Philadelphia, Pa., University Hospital, for instruction, and on completion to his proper station, from Camp Greene, Lieut. ADOLPH VON P. FARDELMANN, Jersey City.

To Rochester, Minn., for instruction, and on completion to Camp Hancock, base hospital, from Fort Benjamin Harrison, Lieut. HENRY G. SMITH, Cedar Grove.

To his home and honorably discharged on account of his inaptitude for the service, Capt. CARL N. WINTSCH, Newark.

To his home and the inactive list on account of being physically disqualified for active service, from Fort Des Moines, Lieut. JAMES R. Stroud, Jersey City.

New Mexico

To Camp Cody, N. M., for duty, Capt. EARL S. BULLOCK, Lieut. ERNEST A. DUNCAN, Silver City.

New York

To Army Medical School, Washington, D. C., for duty in the bacteriological laboratory, from Rockefeller Institute, Lieut. HARRY C. SCHMEISSER, New York City.

To Boston, Boston City Hospital, for instruction and on completion to United States Army General Hospital No. 1, New York City, for duty in the base hospital, from Fort Ayer, Lieut. WATSON A. LAWRENCE, Valhalla; on completion of the course at Boston City Hospital, *to United States Army General Hospital No. 1,* Willoughbridge, N. Y., for temporary duty, Lieut JOSEPH L. McGOLDRICK, Brooklyn; for duty from Camp Upton, Lieut. GESSEL WOLF, New York City.

To Camp Bowie, Fort Worth, Tex., base hospital, from Camp Greenleaf, Capt. WILLIAM R. MAY, New York City.

To Camp Devens, Ayer, Mass., as member of board for examination for tuberculosis, from Camp Bowie, Lieut. HERMAN JUDKOWITZ, Brooklyn.

To Camp Dix, for duty, from Fort Benjamin Harrison, Lieut. HAMILTON M. SOUTHWORTH, Old Chatham.

To Camp Dodge, Iowa, base hospital, from Fort Benjamin Harrison, Lieut. SAMUEL TOPKINS; for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. OSCAR S. ESSENSON, New York City.

To Camp Doniphan, Fort Sill, Okla., base hospital, from Fort Oglethorpe, Lieut. WEBB W. WEEKS, New York City.

To Camp Funston, Fort Riley, Kan., for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut EUGENE CALVELLI, New York City.

To Camp Gordon, Atlanta, Ga., for duty, from Camp Taylor, Lieut. RICHMOND R. HOLT, New York City.

To Camp Grant, Rockford, Ill., as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. CYRENIUS A. NEWCOMB, Newark.

To Camp Greene, Charlotte, N. C., for duty, from Vicksburg, Miss., Major JOHN T. SPRAGUE, St. George.

To Camp Jackson, Columbia, S. C., for duty, from Philadelphia, Capt. CARL EGGERS; for duty in base hospital, from Fort Benjamin Harrison, Lieuts. ROBERT W. PETTIT, New York City, GEORGE B. UBEL, Salamanca.

To Camp Joseph E. Johnston, Jacksonville, Fla., for duty, from Fort Oglethorpe, Lieut. NATHAN ROSENTHAL, New York City.

To Camp Lee, Petersburg, Va., as member of board for examination of command for tuberculosis, Capt. STEPHEN A. MAHADY, Utica. Lieuts. NELSON M. HOLDEN and LOUIS D. STERN, Brooklyn; FRANCIS ARGUS, Buffalo.

To Camp Meade, Annapolis Junction, Md., base hospital, from Camp Meade, Capt. WALDEMAR T. BROWNE, Brooklyn.

To Camp Merritt, Tenafly, N. J., base hospital, from New York City, Capt. HAROLD L. HUNT, New York City.

To Camp Mills, Garden City, L. I., N. Y., for temporary duty, Major JOSEPH COLLINS, New York City.

To Camps Shelby, Beauregard, Logan, Fort Sam Houston, Camps Travis, MacArthur, Bowie, Doniphan, Pike, from Camp Jackson, Major RICHARD H. HUTCHINGS, Ogdensburg.

To Camp Sheridan, Montgomery, Ala., base hospital, Capt. A. I. BENEDICT, Buffalo; from Camp Mills, Capt. GEORGE P. COOPERNAIL, Bedford.

To Camp Sherman, Chillicothe, Ohio, as members of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieuts. BYRON C. SHULTS, Albany, and HOWARD C. MURPHY, Herkimer; for temporary duty at the base hospital, from Camp Upton, Lieut. ALBERT C. DURAND, Ithaca.

To Camp Upton, Yaphank, L. I., N. Y., for duty, from Benjamin Harrison, Capt. WALTER H. VOSBURG, Dunkirk; for examination of command for tuberculosis, from Walter Reed General Hospital, Capt. JOSEPH R. CULKIN, Rochester.

To Camp Wheeler, Macon, Ga., base hospital, from Fort Oglethorpe, Capt. JAMES F. NAGLE, New York City; for temporary duty, from Philadelphia General Hospital, Lieut. PERCY L. DODGE, Poughkeepsie.

To Cleveland, Ohio, for instruction and on completion to Fort Riley, for temporary duty, from Fort Riley, Capt. NATHANIEL P. BREED, Douglaston.

To Fort Banks, Mass., for duty, from Camp Upton, Lieut. WILLIAM J. WANSBORO, Albany.

To Fort Benjamin Harrison, Ind., base hospital, Lieut. WALTER F. MACKLIN, New York City.

To Fort Jay, N. Y., for duty, from Camp Upton, Lieut. ALBERT C. MARGULIES, Brooklyn.

To Fort Logan H. Roots, Ark., for duty in the United States Army General Hospital, Major BRUCE G. PHILLIPS, New York City; for duty in the hospital, from Fort Benjamin Harrison, Lieuts. WILLIAM C. CAUBLE and JOHN J. MADDEN, Brooklyn.

To Fort Meyer, Va., for duty, from Camp Gordon, Lieut. ABRAHAM I. LOWENTHAL, New York City.

To Fort McPherson, Ga., for duty, from Fort Benjamin Harrison, Lieut. JOHN F. HOLDEN, White Plains.

To Fort Niagara, N. Y., for duty as gas instructor, from Fort Sill, Lieut. EDWARD F. GILLICK, Niagara Falls.

To Fort Oglethorpe, Ga., for duty, from Camp Dix, Major HOWARD D. COLLINS, New York City; from Camp McClellan, Major JOHN C. A. GERSTER, New York City; from Camp Dix, Capt. JAMES W. JAMESON, New York City; from Fort Andrews, Capt. SYLVESTER F. O'DAY, New York City; from Camp MacArthur, Lieut. JOSEPH E. RAIA, New York City; from Fort Jay, Lieut. ALBERT C. MARGULIES, Brooklyn. For duty with Evacuation Hospital No. 5, Lieuts. THOMAS J. KIRWIN and ROSCOE C. WEBB, New York City; from Fort Benjamin Harrison, Lieut. HENRY B. SIGLAR, New York City. For duty in Evacuation Hospital No. 6, from Washington University, St. Louis, Lieut. JAMES T. HARRINGTON, Poughkeepsie.

To Fort Riley, Kan., for special duty, and on completion to his proper station, from the office of the Surgeon-General, Capt. GEORGE DRAPER, New York City. For temporary duty from Fort Benjamin Harrison, Lieut. ROY J. MARSHALL, Rome; from Fort Leavenworth, Lieut. DAVID M. KAPLAN, New York City.

To Fort Sam Houston, Texas, for duty, from Fort Benjamin Harrison, Lieut. LOUIS J. SOKOL, New York City.

To Mineola, L. I., Hazelhurst Field, for duty, from Syracuse, N. Y., Lieuts. EARL H. EATON and LAURENT G. FEINIER, New York City.

To New York, N. Y., for duty in connection with the development of special hospitals, and on completion of this duty *to his proper station,* Major THOMAS W. SALMON, Staten Island. For the purpose of enlisting the enlisted personnel of *Base Hospital No. 48,* Major WILLIAM T. HOLMUTH, New York City. *Neurological Institute,* for intensive training in brain surgery, Majors MARTIN B. TINKER, Ithaca, and ALEXANDER NICOLL, New York City; and Capts. GEORGE A. PECK, New Rochelle, and GEORGE S. BRITTEN, Syracuse. For duty as instructor in orthopedic work, from Camp Upton, Capt. BRAINERD H. WHITBECK, Brownville. *Roosevelt Hospital,* for instruction, and on completion *to Fort Riley* for duty in Evacuation Hospital, No. 7, Capt. ARCHER D. BABCOCK, Syracuse. *Bellevue Hospital,* for instruction, and on completion *to Fort Slocum* for temporary duty, from Fort Slocum, Lieut. PERCY H. WILLIAMS, New York City; on completion of course at *Bellevue Hospital, to U. S. Army General Hospital,* for duty, Lieut. ARMSTRONG C. PRATT, New York City; on completion of the course at *Bellevue Hospital,* to *Walter Reed General Hospital,* for duty, Lieut. MAURICE D. BARNETTE, Watertown. For instruction in laboratory work, from Camp Greenleaf, Lieut. ROBERT E. WALSH, New York City. For duty with the *First Depot Battalion,* Lieut. DONALD M. GILDERSLEEVE, Brooklyn.

To Plattsburg Barracks, for duty in connection with the examination of candidates for aviation, from Toronto, Canada, Capt. WILLIAM W. LAING, Brooklyn. For temporary duty, and on completion, *to his proper station,* Capt. GEORGE F. COTT, Buffalo. For duty, and on completion *to his home* and the inactive list, Lieut. EDWARD F. MEISTER, Buffalo.

To Rochester, Minn., for instruction, and on completion of this course *to Camp Gordon,* Lieut. FRANK A. WALDER, Lockport. On completion of the course at Rochester, *to Camp Hancock,* base hospital, from Fort Benjamin Harrison, Lieut. PAUL M. PARKER, Rochester; *to Camp Lee,* Lieut. MILLARD F. SHAFER, Cobleskill; *to Camp Shelby,* Lieut. LEROY D. SOPER, Smyrna; *to Camp Taylor,* base hospital, Lieut. PHILIP GORDON, Rochester; to Fort Snelling, from Fort Benjamin Harrison, Lieut. NORMAN P. BENTLEY, Cape Vincent.

To Rockefeller Institute, N. Y., for instruction, from Fort Oglethorpe, Lieut. NOLAN E. LEAKE, New York City. For instruction in laboratory work, and on completion *to Base Hospital No. 3, First N. Y. Field Hospital Armory,* for duty, Lieut. BERNARD S. DENZER, New York City.

To Washington, D. C., for duty in the office of the Surgeon-General, Capt. CYRUS B. CRAIG, New York City.

To the inactive list from Rockefeller Institute, Major GEORGE BAEHR, New York City.

To his home and the inactive list from Rockefeller Institute, Capt. MORRIS B. BEECROFT, Albany; on account of being physically disqualified for active service, Capt. MALCOLM E. HOUSE, Cuba.

To his home and honorably discharged on account of being physically disqualified for active service, from Fort Benjamin Harrison, Lieut. JAMES H. BLAKENEY, Brooklyn; from Fort Riley, Lieut. SAMUEL W. HOUSTON, Wolcott.

North Carolina

To Annapolis Junction, Md., from Camp Wheeler, Lieuts. NUMA H. CREWS, Henderson, and HECTOR M. PERSON, Saulston.

To Army Medical School, bacteriologic laboratory, from Rockefeller Institute, Lieut. HICKMAN RAY, Raleigh.

To Camp American University, Washington, for duty, from Walter Reed General Hospital, Lieut. JOHN S. McKEE, Raleigh.

To Camp Bowie, Fort Worth, Texas, base hospital, from Camp Greenleaf, Lieut. DARIUS C. ABSHER, Mount Airy.

To Camp Greene, Charlotte, N. C., base hospital, from Fort Oglethorpe, Lieut. CICERO J. ELLEN, Greenville.

To Camp Greenleaf, Fort Oglethorpe, Ga., for instruction, from Camp Jackson, Columbia, S. C., Lieut. RACK F. BENTHALL, Ahoskie.

To Camp Lee, Va., for duty, from Camp Lee, Lieut. BENJAMIN F. CLIFF, East Flat Rock.

To Camp Wadsworth, Spartanburg, S. C., for temporary duty, from Philadelphia General Hospital, Lieut. ADLAI S. OLIVER, Greensboro.

To Fort McPherson, Ga., for duty with Hospital Unit "O" from Fort Oglethorpe, Capt. WILLIAM ALLAN, Charlotte; Lieut. CHARLES I. ALLEN, Wadesboro.

To Fort Morgan, Ala., for duty, from Fort Oglethorpe, Lieut. THOMAS S. McMULLAN, Hertford.

To Fort Oglethorpe, for duty, from Camp Greene, Lieuts. WILLIAM W. GREEN, Tarboro; from Camp Sevier, ROBERT A. MOORE, Charlotte; from Camp Wheeler, CHARLES L. SWINDELL, Wilson; from Richmond Medical School, ROLAND S. CLINTON, Rocky Mountain.

To New York City, Post-Graduate Hospital, instruction in urology and dermatology, Lieut. JOSEPH W. HOOPER, Wilmington.

To Washington Barracks, to examine recruits in his specialty, from Gettysburg, Pa., Lieut. ALBERT DURHAM, Charlotte.

To Washington, D. C., for duty, from American Expeditionary Forces, France, Lieut. EDWARD B. BEASLEY, Fountain.

North Dakota

To Camp Taylor, as member of board for the examination of command for tuberculosis, Lieut. HERBERT B. WENTZ, Verona.

Ohio

To Camp Custer, Battle Creek, Mich., base hospital, from Fort Benjamin Harrison, Lieut. MURRAY B. McGONIGLE, Toledo.

To Camp Dix, Wrightstown, N. J., base hospital, from Rockefeller Institute, Lieut. HAROLD O. RUH, Cleveland.

To Camp Dodge, Des Moines, Iowa, base hospital, from Fort Benjamin Harrison, Lieuts. EDGAR H. JOHNSTON, Alexandria; CARLTON D. POSTLE, Columbus; for examination of command for tuberculosis, WILEY T. SPRAGUE, Athens.

To Camp Funston, Fort Riley, for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. MARION WHITACRE, Cincinnati.

To Camp Greenleaf, Fort Oglethorpe, Ga., for instruction, from Camp Wheeler, Capt. SAMUEL HINDMAN, Columbus.

To Camp Hancock, Augusta, Ga., base hospital, from Rockefeller Institute, Lieut. ROY P. FORBES, Cleveland.

To Camp Jackson, Columbia, S. C., base hospital, from Fort Benjamin Harrison, Lieut. RICHARD S. MOYNAN, Columbus.

To Camp Kearney, Linda Vista, Calif., base hospital, from Fort Benjamin Harrison, Lieut. MELVILLE D. SOASH, Westerville.

To Camp MacArthur, Waco, Texas, for duty, from Fort Sill, Capt. ROY K. EVANS, McGuffey.

To Camp Taylor, Louisville, Ky., as member of board for examination of command for tuberculosis, Lieuts. CHARLES B. HAMMA, Springfield; from Fort Benjamin Harrison, ROBERT CLARKE, Cleveland; IRWIN W. MAYBERRY, Scottown.

To Camp Upton, Yaphank, L. I., N. Y., base hospital, from New York Post Graduate Hospital, Lieut. ALVAH S. McLAIN, Lakewood; for duty, from Evans Dental Institute, Philadelphia, Lieut. ARTHUR J. McCRACKEN, Bellefontaine.

To Camp Wheeler, Macon, Ga., for duty, from Fort Benjamin Harrison, Lieut. REEVES W. DeCROW, Sciotoville; from Philadelphia General Hospital, Lieut. HARRY H. McCLELLAN, Dayton.

To Cleveland, Ohio, for instruction, and on completion *to Camp Greene*, base hospital, Capt. HARRY T. MILLER, Springfield; *to Camp McClellan*, base hospital, Lieut. THOMAS H. BROWN, Toledo.

To Fort Oglethorpe, Ga., for duty, from Camp Sherman, Lieuts. GEORGE M. LOGAN, Akron; RALPH B. THOMPSON, Solon.

To Fort Omaha, Neb., for duty, from Fort Benjamin Harrison, Lieut. PAUL F. DAVIDSON, Cleveland.

To Fort Riley, Kan., for instruction, Lieuts. WILLIAM J. TOPMOELLER, Cincinnati; ARTHUR H. HIXSON, Columbus; from Fort Benjamin Harrison, Lieut. EDWARD KUCK, Cincinnati.

To Hot Springs, Ark., for duty in the Army and Navy General Hospital, from Fort Screven, Ga., Lieut. JOHN H. SCHROEDER, Cincinnati.

To Jefferson Barracks, St. Louis, Mo., for duty in his specialty, Lieut. GEORGE H. REEVE, Cleveland.

To New York City, Post-Graduate Hospital, for instruction in urology and dermatology, Lieut. WILLIAM N. TAYLOR, Columbus.

To Rochester, Minn., for instruction, and on completion *to Camp Gordon*, Lieut. JEFFERY J. VEGA, National Military Home; on completion *to Camp Taylor*, Lieut. GALE C. GUTHRIE, Uhrichsville; on completion *to Camp Wadsworth*, Lieut. DONALD DeC. SHIRA, Larue; on completion *to Camp Wheeler*, Lieut. WILLIAM M. SHAPIRO, Toledo.

To his home and honorably discharged on account of being physically disqualified for active service, Major BURT W. WILSON, Youngstown.

To the inactive list, from Evans Dental School, Philadelphia, Lieut. LOUIS H. SCHRIVER, Cincinnati.

Oklahoma

To Atlanta, Ga., Department Laboratory, for duty, from Rockefeller Institute, Lieut. EDWARD B. BROOKS, Shawnee.

To Camp Lee, Petersburg, Va., as member of board for examination of command for tuberculosis, Lieut. LOUIS L. JACOBS, Vivian.

To Fort Riley, Kan., for duty with Evacuation Hospital No. 7, from Camp MacArthur, Lieut. SIMS D. BEVILL, Potean.

To Camp Sherman, base hospital, Lieut. CHONNER P. CHUMLEY, Washington.

To Philadelphia, for orthopedic instruction, from Camp Alfred Vail, Lieut. WILLIS K. WEST, Oklahoma City.

To report to the commanding general, Southern Division, for assignment to duty, Lieut. MARVIN E. STOUT, Oklahoma City.

Pennsylvania

To Camp Meade, Annapolis, Md., from Camp Wheeler, Lieuts. JACOB J. SCHWEGLER, Kennett Square; FRANK R. WHEELOCK, Scranton.

To Army Medical School, Washington, D. C., for instruction, Lieut. JAMES C. HARDING, Philadelphia; for duty in the bacteriologic laboratory, from Rockefeller Institute, Lieut. JOHN W. GOODSELL, New Kensington.

To Camp Custer, Battle Creek, Mich., base hospital, from Fort Benjamin Harrison, Lieut. FRANK H. KELLY, McKeesport.

To Camp Devens, Ayer, Mass., as member of board for examination of command for tuberculosis, Capt. DANIEL M. HOYT, Philadelphia.

To Camp Funston, Fort Riley, for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. MAURICE I. STEIN, New Bloomfield.

To Camp Greene, Charlotte, N. C., for duty, from Fort Benjamin Harrison, Lieut. WARREN STIRLING, Philadelphia.

To Camp Meade, Annapolis, Md., for duty, from Camp Wheeler, Lieut. WILLIAM F. CRAIG, Philadelphia.

To Camp Shelby, Hattiesburg, Miss., base hospital, from Fort Oglethorpe, Lieut. THOMAS W. GRAYSON, Pittsburgh.

To Camp Upton, Yaphank, L. I., N. Y., base hospital, from Allentown, Pa., Capt. JOHN A. HAWKINS, Pittsburgh.

To Camp Wadsworth, Spartanburg, S. C., for temporary duty, from Philadelphia, Capt. ERNEST M. VAUGHAN, Royersford.

To Camp Wheeler, Macon, Ga., base hospital, from Camp Greenleaf, Lieut. CORTLAND W. W. ELKIN, Pittsburgh.

To Fort Clarke, Texas, for duty, with the Sanitary Train, from Fort Benjamin Harrison, Capt. CAREY J. VAUX, Pittsburgh.

To Fort Leavenworth, Kan., for duty, from Camp Wheeler, Lieut. WILDER J. WALKER, Wilkinsburg.

To Fort Logan H. Roots, Ark., for duty in the United States Army General Hospital, from Gettysburg, Capt. CLIDE L. CURLL, Pittsburgh.

To Fort Oglethorpe, Ga., for instruction, from Rockefeller Institute, Lieut. PHILIP F. WILLIAMS, Philadelphia.

To Fort Riley, Kan., for instruction, from Camp Sheridan, Capt. CHARLES B. REITZ, Allentown.

To Fort Sam Houston, for duty in the department laboratory, from Rockefeller Institute, Lieut. ERNEST J. ATEN, Pittsburgh.

Honolulu, Hawaii, for duty, from Fort Benjamin Harrison, Lieut. RAY M. ALEXANDER, Bolivia.

To Newport News, for duty, from Fort Monroe, Lieut. MAURICE GOLDBERG, Philadelphia.

To New York City, Neurological Institute, for intensive training in brain surgery, from Surgeon-General's Office, Capt. FLOYD E. KEENE, Philadelphia; to Post-Graduate Hospital for instruction in urology and dermatology, Capt. WARREN WALKER, Philadelphia; Lieuts. JACOB R. BROBST, Bloomsberg; DAVID S. GRIM, Reading.

To New York City, Neurological Institute, for intensive training in brain surgery, Lieuts. NATHAN R. GOLDSMITH, Philadelphia; from Camp Greenleaf, MARSHALL C. RUMBAUGH, Dorranceton.

To United States Army General Hospital No. 4, for duty with Hospital Unit "A," Lieut. WILLIAM C. POWELL, Bryn Mawr.

Honorably discharged on account of being physically disqualified for active service, Capt. JOHN C. DaCOSTA, Jr., Philadelphia.

Honorably discharged, Lieut. CHARLES S. ROTTNER, Philadelphia.

To his home and honorably discharged on account of being physically disqualified for active service, Capt. LAUREN C. THOMAS, Latrobe.

To the inactive list, from Camp Greenleaf, Lieut. SAMUEL McCLARY, Philadelphia.

Rhode Island

To Camp Dix, Wrightstown, N. J., for duty, from Fort Benjamin Harrison, Capt. THOMAS F. SCANLON, Providence.

To Camp Logan, base hospital, from Camp Beauregard, Capt. ROSWELL S. WILCOX, Providence.

To Camp Upton, Yaphank, L. I., N. Y., for examination of command for tuberculosis, from Walter Reed General Hospital, Lieut. NORMAN B. COLE, Newport.

To Morrison, Va., for duty, from Fort Benjamin Harrison, Lieut. BENJAMIN J. BUTLER, East Providence Center.

South Carolina

To Fort Logan H. Roots, Ark., for duty, from Gettysburg, Pa., Capt. LAWRENCE R. CRAIG, Dillon.

To Fort McPherson, Ga., for duty with Hospital Unit "O," from Camp Greene, Charlotte, N. C., Lieut. ROBERT H. CRAWFORD, Rock Hill.

South Dakota

To Fort Oglethorpe, Ga., for duty, from Fort Riley, Lieut. LINDSAY Z. FLETCHER, Montrose.

Tennessee

To Army Medical School, Washington, D. C., for duty in the bacteriologic laboratory, from Rockefeller Institute, Lieut. ANDREW B. JONES, Nashville.

To Camp Lee, Petersburg, Va., for temporary duty, from Philadelphia General Hospital, Lieut. HOWARD M. FRANCISCO, Nashville.

To Fort McPherson, Ga., for duty with Hospital Unit "S," Capt. ALBERT W. HARRIS, Nashville.

To Knoxville, Tenn., to report to the recruiting officer for duty, Lieut. REESE W. PATTERSON, Knoxville.

New Orleans, Charity Hospital, for instruction, and on completion *to Fort Worth, Texas,* base hospital, Lieut. PAUL H. FAUCETT, Columbia.

To New York City, Post-Graduate Hospital, for instruction in dermatology and urology, from Camp Lee, Lieut. BENJAMIN C. ARNOLD, Jackson.

Texas

To Camp Bowie, Fort Worth, Texas, base hospital, from Camp Greenleaf, Lieut. CALVIN W. DAVIS, Long View.

To Camp Kearney, Linda Vista, Calif., base hospital, Lieut. WILL M. SCHULTZ, Georgetown.

To Camp Meade, Annapolis Junction, Md., for temporary duty, from Evans Dental Institute, Philadelphia, Capt. JOSEPH E. JOHNSON, Kirvin.

To Camp Taylor, Louisville, Ky., base hospital, from Evans Dental Institute, Philadelphia, Major WILLIAM E. HALL, Texas City.

To Fort Riley, for duty with Evacuation Hospital No. 7, from Camp Grant, Lieut. GEORGE L. LANGWORTHY, Lakeview.

To Fort Sam Houston, for duty in the department laboratory, from Rockefeller Institute, Lieut. RICHARD C. CURTIS, Temple.

To Garden City, L. I., N. Y., for duty, from San Antonio, Texas, Lieut. DOUGLAS S. EDWARDS, San Antonio.

To Morrison, Va., for duty, from Richmond, Va., Lieut. HENRY F. WILKINS, Fort Worth.

To report by wire to the Commanding General, Southern Department, Lieut. CHARLES F. CLAYTON, Lubbock.

To report in person to the governor, Panama Canal, for assignment to duty, from Panama Canal Department, Lieut. PAUL J. CONNOR, Madisonville.

Utah

To Camp Gordon, Atlanta, Ga., as member of board for examination of command for tuberculosis, from Camp Greenleaf, Lieut. GEORGE E. McBRIDE, Magna.

Vermont

To Camp Greenleaf, Fort Oglethorpe, Ga., for instruction, Lieut. DENNIS J. SHEEHAN, Lyndonville.

To Camp Sherman, Chillicothe, Ohio, as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. ROLLIN D. WORDEN, Montgomery Center.

Virginia

To Camp Lee, Petersburg, Va., for duty, Lieuts. OLIVER C. BRUNK, Richmond; JULIUS J. HULCHER, Richmond; GEORGE S. BURT, Roanoke; for duty in the base hospital, from Fort Benjamin Harrison, Lieut. JUNIUS E. WARINNER, JR., Richmond.

To Camp Taylor, Louisville, Ky., base hospital, from Evans Dental Institute, Lieut. SAMUEL P. CAST, Portsmouth.

To Camp Upton, Yaphank, L. I., N. Y., for examination of command for tuberculosis, from Walter Reed General Hospital, Lieut. THOMAS N. DAVIS, Lynchburg.

To Fort Oglethorpe, for duty with Evacuation Hospital No. 3, from Camp Greenleaf, Lieut. WILLIAM L. BRENT, Colonial Beach.

To Fort Omaha, Neb., for duty, from Fort Benjamin Harrison, Lieut. GRANVILLE EASTHAM, Rapidan.

To Fort Riley, Kan., base hospital, from Fort Benjamin Harrison, Lieut. ROBERT J. STYER, Jetersville.

Washington

To Army Medical School, Washington, D. C., for duty in the bacteriologic laboratory, from Rockefeller Institute, Capt. AUSTIN U. SIMPSON, Seattle.

To Fort Des Moines, Iowa, from Camp Robinson, Sparta, Wis., Capt. IRA C. BROWN, Seattle.

To his home and honorably discharged on account of being physically disqualified for active service, from Camp Lewis, Lieut. CHARLES S. NOBLE, Seattle.

West Virginia

To Camp Lee, Petersburg, Va., as member of board for examination of command for tuberculosis, Lieut. DAVID P. SCOTT, Ashland.

Wisconsin

To Camp Custer, Battle Creek, Mich., as member of board for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. IRVING A. MYERS, Cottage Grove.

To Camp Dodge, Des Moines, Iowa, for examination of command for tuberculosis, from Fort Benjamin Harrison, Lieut. CHARLES H. MEYST, Burlington.

To Camp Pike, Little Rock, Ark., for base hospital, from Fort Benjamin Harrison, Lieut. CHARLES B. RYDELL, Superior.

To Cleveland, Ohio, for instruction and on completion *to Camp McClellan,* base hospital, Lieut. GUSTAVE E. ECK, Lake Mills.

To Fort Logan H. Roots, Ark., base hospital, from Fort Benjamin Harrison, Lieut. LEO H. FLYNN, Eau Claire.

To Fort Oglethorpe, for duty, from Camp Meade, Capt. RALPH KAYSON, Plymouth.

To Fort Riley, Kan., for instruction, Capt. CHARLES A. CRITCHLOS, Mellen.

To New York City, for instruction, and on completion *to Rochester, Minn.,* for instruction, Lieut. THOMAS J. SNODGRASS, Janesville; *to Post-Graduate Medical School* for instruction in urology and dermatology, from Fort Ethan Allen, Lieut. ELIAS BIBBY, Milwaukee.

To Pittsburgh, Pa., for instruction in military roentgenology, Capt. GENTZ PERRY, Amery.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Dinner to Base Hospital Staff.—At a banquet given at the Los Angeles Athletic Club, November 8, by 125 physicians of Los Angeles and vicinity, the guest of honor was Dr. Rea E. Smith, and sixteen other physicians of Los Angeles who make up the base unit for war service. Dr. Walter Lindley officiated as toastmaster.

Personal.—Dr. George A. Zorb, a member of the resident staff of the Receiving Hospital, Los Angeles, has been seriously ill from septicemia, due to an operation wound, but is now convalescent.——Dr. Clarence A. Wills, San Leandro, for many years superintendent of the Alameda County Infirmary, Oakley, has resigned to enter the military service.

CONNECTICUT

Personal.—The directors of the Gaylor Farm Sanitarium, New Haven, have voted a leave of absence for six months to the superintendent, Dr. David R. Lyman, who is going to France to study tuberculosis conditions.——Dr. J. E. Radding has been appointed assistant to Dr. James B. Dinnan, superintendent of the State Sanatorium, Meriden, succeeding Dr. Cole B. Gibson, who has entered military service.

Dietitians Organize.—The Connecticut Association for Dietitians has recently been organized. The object of the organization is to promote closer cooperation between dietary departments and allied departments. While the founders are hospital dietitians only, membership is open to all who have contributed to and are interested in the advancement of dietetics. It is thought that there is a great need of better trained dietitians, and that this can be accomplished by close work among physicians, hospital superintendents, heads of home economics departments and hospital dietitians. At the November meeting, held at Grace Hospital, New Haven, the following officers were elected: president, Miss E. M. Geraghty, New Haven; vice president, Miss Laura Siegel, Stamford, and secretary-treasurer, Miss Ethel C. Pipes, Hartford.

ILLINOIS

Personal.—Harold B. Fromme, Peoria, has been appointed quarantine officer by the state director of health, and detailed to duty at Camp Grant, Rockford, succeeding P. E. Cooney.

Health of Chicago.—November 24, fifty-four new cases of diphtheria and six deaths from this disease were reported to the health department. Infantile paralysis is rapidly disappearing. The health department is urging citizens to boil water, as recent severe storms have made the lake water of doubtful purity. Chlorination is being resorted to as a means of controlling the contamination.

Control of Venereal Diseases.—Rules for the control of venereal diseases in Illinois, including placarding of immoral houses, provided especially to protect troops quartered in the state were announced by Dr. C. St. Clair Drake, state director of health. The regulations include reports of all cases of venereal diseases and the placarding of all premises suspected

of being used for immoral purposes, the provision of proper medical care for indigent infected persons, and the prohibiting of engaging in any occupation the nature of which is such that it may be borne to others of any person having active infectious venereal disease. Penalties of a fine up to $200 or imprisonment in jail, not to exceed six months, or both, are provided for violation of the regulations.

Antituberculosis Meeting.—At the ninth annual meeting of the Illinois Association for the Study and Prevention of Tuberculosis, held in Champaign, November 9, the following officers were elected: president, Dr. George Thomas Palmer, Springfield (reelected for the seventh term); vice presidents, Dr. William A. Evans, Chicago; Ethan Allen Gray, Chicago; Cecil M. Jack, Decatur, and Lewis C. Taylor, Springfield; secretary, Dr. Jeanette C. Wallace, Peoria; treasurer, Mr. David R. Forgan, Chicago; executive committee, new members: Dr. James W. Pettit, Chicago; Mrs. Joseph T. Mason, Aurora, and George W. Perkins, Chicago, and holdover members, Mrs. A. L. Adams, Jacksonville; Dr. Edward W. Fiegenbaum, Edwardsville, and Dr. Orville W. McMichael, Chicago.

INDIANA

District Meeting.—The annual meeting of the Seventh Indiana Councilor District Medical Association was held in Danville, November 21. Dr. Samuel E. Earp was elected president; Dr. Murray N. Hadley, secretary, and Dr. Thomas B. Eastman, councilor, all of Indianapolis.

Personal.—Drs. Eric A. Crull, Adam L. Schneider and Abraham J. Kesler, all of Fort Wayne, have been appointed members of the board of health of that city.——Dr. Benjamin F. Tetters, Middlebury, who was operated on recently, is reported to be making satisfactory progress toward recovery.

State Housing Laws.—The state board of health has issued orders to the city boards of health of Gary, Whiting, Hammond, East Chicago and Indiana Harbor that they take immediate steps to enforce the state housing laws. If the cities do not respond, the state board will take charge and enforce the laws in an effort to clean up the "gross insanitary conditions" in those cities.

New Isolation Hospital.—Plans have been submitted to the city board of health, Indianapolis, for a new contagious disease hospital to cost from $90,000 to $100,000. Investigation will start at once to see if money will be available for the construction of the building at this time. While the present facilities for the treatment of persons with contagious diseases are inadequate, it is not believed that the building can be constructed at this time, owing to the lack of funds.

IOWA

Hospital Unit Mobilizes.—Hospital Unit K, Council Bluffs, was mobilized at Fort Porter, N. Y., November 14, and is being equipped for service. This unit consists of twelve medical officers, one head nurse, twenty female nurses and fifty enlisted men. The medical personnel consists of the following reserve officers: Major Donald Macrae, Jr., director, Council Bluffs; Capts. F. Earl Bellinger, general surgery, Council Bluffs; John W. Shuman, chief medical officer, Sioux City; Louis L. Henninger, eye, ear, nose and throat, Council Bluffs, and Chalmers A. Hill, orthopedic surgery, Council Bluffs; Lieuts. John S. McAtee, genito-urinary surgery; Robert S. Moth, adjutant, medical, and Louis E. Hanisch, general surgery, Council Bluffs; Aldis A. Johnson, pathologist and bacteriologist, and George P. Pratt, medical, Omaha; Robert C. Crumpton, medical, Webster City, and Albert E. Sabin, medical, Kirkman.

Personal.—Lieut. Daniel J. McCarthy, M. R. C., U. S. Army, Davenport, who recently started for Roumania, has arrived safely in Moscow, Russia.——Dr. Emil O. Ficke, Davenport, formerly the county physician, has been appointed a member of the Board of Commissioners for the Insane of Scott County, to succeed Dr. John A. DeArmand, deceased.——Drs. James M. Fettes, William T. Shepard, G. Henry Mammen, William W. Larsen and Martin J. Joynt, all of LeMars, have united to form the LaMars Clinic, which will be located on the second floor of the Royal Building.——Dr. James B. Miner, Augustus F. Kober, Julius Niemack and Raymond W. Stober, all of Charles City, have been elected directors of the Cedar Valley Hospital, Charles City.——Dr. Mark F. Boyd, professor of preventive medicine and hygiene in the State University of Iowa, Iowa City, has accepted the position of head of the department of bacteriology in the University of Texas, Galveston.

MARYLAND

Personal.—Lieut. James M. Shields, formerly of Colorado, has been stationed at the base hospital at Fort McHenry, where he will have charge of the eye, ear, nose and throat ward.——Dr. Alexander R. Mitchell, Monkton, has been appointed health officer of the seventh district of Baltimore County.——Dr. James A. Nydegger, U. S. P. H. S., Baltimore, delivered an address on the "Relation of the Rural Schools to National Health," at the Maryland State Teachers' Association. Dr. Nydegger claims the insanitary condition of our rural schools is the chief cause of the poor physical condition of so many young men who have been drafted and found to be unfit for military service.——Dr. William S. Thayer, who has been in Petrograd for several months with the American Red Cross Mission, is on his way back to the United States.

Report of Lunacy Commission.—At the semiannual meeting of the State Lunacy Commission with the boards of managers of the State Institutions for the Insane and Feebleminded and the Board of State Aid and Charities, held, November 22, in Baltimore, the report of the commission showed that there were in the twenty institutions under the supervision of the commission, on Sept. 30, 1917, 5,196 patients, or one patient to every 262 of the population of Maryland. There were admitted during the biennial period, 4,557 patients. The total number of patients discharged and died during the biennial period was 4,194, leaving a net increase of 363 patients for the two years. During the past five years there has been an average yearly net increase of 150 patients. The report on the after-care work for the past year showed that a saving of $10,693 had been made by paroling patients under the supervision of the after-care agent and making them more or less self-supporting. In all 124 patients were paroled under the supervision of this department. As a result of a preliminary survey of the feebleminded, conducted through the cooperation of the Committee on the Prevention of the Feebleminded, it was recommended that a complete survey of this class of defectives be made throughout Maryland, during the coming year. The report urges that farm colonies be established at the state institutions to supply sufficient beds for the rapidly increasing number of insane and feebleminded at the lowest possible per capita, as well as to increase the farming activities of the institutions.

MISSOURI

Correction.—The statement in a recent issue that Dr. William A. Clark, Jefferson City, had been appointed physician to the penitentiary was erroneous. Dr. Clark is only acting as prison physician at the request of the board until the board can decide on a permanent appointment.

Free Syphilis Clinics.—The health department of St. Louis has completed plans for establishing free syphilis clinics under municipal control. All persons affected with syphilis in its infectious stage will be urged to go to the municipal clinic for treatment where at least two injections of salvarsan will be administered. An active campaign of education will be conducted to familiarize the people with the importance of these clinics and the benefits of early treatment of syphilis. It is the first instance of municipal clinics for syphilis to be established in this country.

Personal.—Dr. Alfred B. Miller, Macon, had a narrow escape from serious injury, when the front wheels of his automobile ran into an open gulley, the bridge having been broken down by a traction engine. He managed to stop his car on the brink, though the front wheels were extending over at least a foot.——Dr. Robert F. Hyland, St. Louis, suffered severe injuries on November 15, when his automobile collided with a motor truck.——Dr. Clarence A. McGuire, Kansas City, now on duty at a base hospital in France, has recovered from the injuries he suffered at the time Dr. Fitzsimmons was killed by a bomb dropped from a German aeroplane.

NEW YORK

Personal.—Dr. Joseph S. Lewis, Buffalo, suffered a fracture of the clavicle and other injuries in a collision between his automobile and a street car, November 14.——Dr. Edward Danforth, Bainbridge, who is in the military service in France, is reported to be ill.

Dinner Given Bissell.—The first health officers' class of the University of Buffalo gave a complimentary dinner to Dr. William G. Bissell, Buffalo, bacteriologist and chief of the bureau of laboratories of the Buffalo Department of Health and his assistants, at the Hotel Statler, November 21. Dr. Fowler A. Watters, Lockport, officiated as toastmaster, and

addresses were delivered by Dr. Thomas H. McKee, dean of the University of Buffalo, on "The Attitude of the University of Buffalo Toward Health Officers and Their Work," and by Dr. William G. Bissell, on "The Need of a Closer Union Between Civil Laboratories and Rural Communities, and How to Obtain It." At the conclusion of this program, impromptu speeches were made.

New York City

Bellevue Hospital Unit Mobilizes.—The Base Hospital Unit of Bellevue Hospital has mobilized its 300 members at the Twelfth Regiment Armory. Among the personnel of the unit are thirty-five doctors and eighty-three nurses.

Reclamation Gymnasium.—Cornell University Medical College announces that it is about to establish a reclamation gymnasium in which classes will be conducted for men who have been rejected from the army and navy services on account of minor physical defects.

Flower Hospital Raises Flag.—Flower Hospital recently unfurled a service flag, carrying 120 stars, the gift of Major William Tod Helmuth and Mrs. Royal S. Copeland. As a part of the ceremony of presentation, 300 medical students in uniform paraded in the vicinity of the hospital.

Enforcement of Antispitting Law.—Health Commissioner Emerson has ordered police departments to enforce the antispitting law and to arrest all who spit in public places. In a letter to Chief Magistrate McAdoo he asks that the police magistrates act with determination in imposing suitable sentences on all such offenders.

The Hospital Intern Problem.—At a meeting of the Public Health Committee of the New York Academy of Medicine, regarding the hospital intern problem, the following resolution was adopted and endorsed by the president on behalf of the academy:

Resolved, That the Public Health Committee of the New York Academy of Medicine suggest to the Surgeon-General of the United States Army the desirability of a change in the wording of the "Circular of Information on the Completion of Internships of Commissioned Officers (Form I-1)," permitting the period of internship to terminate in December of the year following graduation instead of in July of that year. Permission to remain on the inactive list for the period named should, of course, be granted only "if the exigencies of the service permit."

Personal.—Dr. Katherine B. Davis, who was recently appointed head of the New York Parole Board by Mayor Mitchell, has resigned to accept the general secretaryship of the Rockefeller Bureau of Social Hygiene.——Capt. Bertram DeN. Cruger, who is a member of the parole board, at present on leave of absence as a captain in charge of a depot brigade at Camp Upton, has been appointed to the position of head of the parole board for a term of ten years at a salary of $7,500 a year.——Dr. Theron J. Vosburgh has been appointed superintendent of the city farm at Warwick, which is conducted by the Board of Inebriety, to succeed Dr. Charles S. Stokes, who resigned a short time ago. The position carries a salary of $5,000.

Plan to Reduce the Number of Physically Unfit Sent to Camps.—Charles E. Hughes, chairman of the District Board of Appeals for New York, has appointed a committee of five physicians whose duties will be to try to find a way of reducing the number of physically unfit men sent to the National Army cantonments. The members of this committee are Drs. Ernest L. Hicks, George E. Doty, James E. Shuttleworth, Herman T. Radin and James S. Waterman, Brooklyn. The appointment of this committee was made at the suggestion of Dr. Robert L. Dickinson, Brooklyn, assistant chief of the Medical Committee on National Defense. It is said that from 2 to 9 per cent. of the men sent to the camps have been rejected after their arrival at the cantonments.

The Nursing Situation in New York.—The Standing Committee on Nursing of the Mayor's Committee of Women on National Defense has made a survey of the nursing situation in this city. Their census shows that there are in New York City 17,377 people engaged in some form of nursing service. Of this number 6,459 are graduate registered nurses and 3,849 are graduate nurses who are not registered. One in four of the registered nurses is enrolled with the Red Cross Nursing Service, making 1,701 Red Cross nurses who may be called on for war service. Probably 1,000 of these will be needed during the year. The pupil nurses who will be graduated during the year number 824; this leaves about 150 whose places will not be filled by new graduates. Several hospitals in order to meet the demand have taken larger classes than usual, Bellevue Hospital having initiated a plan of taking a certain number of pupil nurses who bear their own living expenses. Several hospitals are offering a shorter course to college women whom it is hoped will be qualified to take responsible positions in institutions and in the public health field. The report urges qualified young women to take up the profession of nursing in the training schools and prepare to fill the gaps in the nursing service that will be left open as the war goes on.

NORTH DAKOTA

Personal.—Dr. Charles H. Aylen, Drayton, left, November 14, for Winnipeg, to enter the Canadian Army Medical Corps.

Compulsory Vaccination.—North Dakota has had a compulsory vaccination law for several years, but it has never been enforced. Compulsory vaccination will be required in the schools of the state, this year, for the first time in its history. Reports to the state board of health, according to the *Bulletin* for October, indicate that at the present time, about 90 per cent. of the schools have observed the requirements.

OHIO

Sanatorium Completed.—The Fountain Park Sanitarium in Champaign County is now ready for occupancy. The building is three stories in height, erected at the approximate cost of $80,000.

Personal.—Dr. Abraham J. Shoemaker, Columbus, has resigned as night physician at the state penitentiary.——Dr. Sterling B. Taylor, Columbus, has assumed his duties as chief surgeon of the Toledo and Ohio Central and Zanesville and Western Railroads, with headquarters in Columbus.

Hospital Notes.—The old Schwartz Castle, Columbus, has been remodeled and opened as the Columbus Maternity Hospital. Dr. A. Livingston Stage is president of the corporation, which is not for profit. The hospital is open to all reputable physicians.——The effort adequately to care for charity patients at the hospitals of Marion was begun, October 20, by the city members of the Marion County Medical Society. By means of this organization all charity cases approved by the Marion Social Service League will be treated at the Marion General Hospital, or the Orchard Hospital. Dr. Auguste Rhu was selected as chief of staff, and Dr. Dana O. Weeks, secretary.

PENNSYLVANIA

Personal.—Dr. John L. Sagerson, Johnstown, who was painfully injured in an automobile accident, November 14, is reported to be doing well.——Lieut. G. Franklin Bell, M. R. C., U. S. Army, Williamsport, who has been ill at the cantonment camp, Greenville, S. C., is reported to be convalescent.

Medical Aid Society Elects.—At the annual meeting of the Aid Association of the Philadelphia County Medical Society, November 12, Dr. Samuel D. Risley was elected president, succeeding Dr. Jacob R. Shellenberger, relieved at his own request, and the following officers were reelected: vice president, Dr. Edward E. Montgomery; secretary, Dr. Lewis H. Adler, Jr.; treasurer, Dr. John B. Turner; consultant, Francis C. Adler, and directors, Dr. Isidor P. Strittmatter, William S. Wray and William T. Hamilton.

TEXAS

Changes in Regents' Board.—Dr. Ralph Steiner, Austin, has been appointed a member of the board of regents of the University of Texas, and Dr. S. J. Jones, Salado, has resigned as a member of the board.

The State Board and the State Journal.—An arrangement has been made by which the matter heretofore contained in the *Monthly Bulletin* of the Texas Board of Health will be printed in the *State Journal of Medicine*, which is owned by the state medical association. This is similar to the arrangement in Ohio. The separate bulletin of the department is to be discontinued.

Society Meeting.—At the annual meeting of the Fourth District Medical Society, held in Brownwood, November 10, Dr. Joseph E. Dildy, Lampasas, was elected president, and Dr. J. William Blasdell, Ballinger, secretary. Coleman was selected as the place of meeting for next year.——At the semiannual meeting of the South Texas District Medical Society, held in Beaumont, October 11, Dr. James E. Thompson, Galveston, was elected president; Dr. Wil T. Williams, Beaumont, vice president, and Dr. Albert H. Braden, Beaumont, secretary-treasurer. Houston was selected as the next place of meeting.

Bureau of Rural Sanitation.—The Texas State Board of Health has created a Bureau of Rural Sanitation whose

activities will be devoted to directing, supervising and assisting in rural health work. Dr. Platt W. Covington, Marquez, has been placed at the head of the department. From $3,000 to $6,000 will be spent this year in intensive community health work in the rural districts of the counties agreeing to employ four local assistants at $50 a month each, for a period of four, eight or twelve months. These assistants are to work with a staff of trained sanitarians furnished by the state and the International Health Board, the state legislature having made an appropriation of $90,000 for joint work with the International Health Board for intensive measures against preventable diseases in the rural districts. The following counties have made appropriations, under the foregoing arrangements, to carry on this work: Harris, Dallas, McLennan, Bexar, Jefferson, San Jacinto, Polk, Leon, Hardin, Trinity and Wharton. The work is now in progress in Polk, Dallas and Harris counties.

CANADA

Personal.—Lieut.-Col. Walter T. Connell, C. A. M. C., has resigned as consulting physician to the Kingston (Ont.) Penitentiary, and has been succeeded by Dr. Robert Hanley, Kingston.——Lieut.-Col. Charles H. Gilmour, Toronto, now surgeon-in-chief of the Ontario Military Hospital, Orpington, England, has been made a member of the Royal College of Surgeons, London.

Hospital News.—Oshawa, Ont., is to have a maternity hospital, a donation of his residence, by Mr. R. S. McLaughlin of that town.——The Isolation Hospital at Saskatoon, Sask., has been completed. It is situated adjacent to the city hospital, comprises four wings and contains twelve wards, with additional accommodation for the nursing staff. Accommodation is also provided for insane patients pending their removal to a hospital for the insane; so it will be no longer necessary to place such patients in the common jail.——The Esquimalt Convalescent Hospital has lately been extended by the addition of a department of vocational training. The medical officer in charge is Dr. Edward S. Hasell, who was formerly on the surgical staff of the Royal Jubilee Hospital, Victoria, B. C.

University News.—In a recent speech Sir Robert Falconer, president of the University of Toronto, stated there were at present over 6,000 undergraduates of that university on active service overseas, 1,000 of whom were serving in the ranks. He considers that medical students should be exempt from conscription in Canada, and that the medical faculties of the universities in Canada should be formed into medical corps so as to be available if required for the treatment of returned soldiers.——Lieut.-Col. Hadley Williams, London, Ont., has returned from the Ontario Military Hospital, Orpington, England, and has resumed his duties as professor of surgery in the Western University, London, Ontario.——Dalhousie University, Halifax, N. S., has the largest registration in the first year class in medicine in its history. Most of the students of the higher years have returned, but many members of the teaching staff are still on active military service.——The total number of students registered in the medical faculty of McGill University, Montreal, is 362; in the first year there are ninety-three men, a larger number than last year. Fifth year students will be graduated on April 1, so as to permit of going overseas immediately thereafter.

GENERAL

Southern Medical Women Meet.—At the fifth annual meeting of the women physicians of the Southern Medical Association which was held in Memphis, November 13, the following officers were elected: president, Dr. M. Louise Strobel, Washington, D. C.; vice presidents, Drs. Elizabeth C. Kane, Memphis, Tenn., and Olive A. C. Wilson, Paragould, Ark., and secretary-treasurer, Dr. L. Rosa H. Gantt, Spartanburg, S. C.

Southern Railway Surgeons Elect Officers.—At the annual meeting of the Southern States Association of Railway Surgeons, held in connection with the meeting of the Southern Medical Association at Memphis, November 14, Dr. Inman W. Cooper, Meridian, Miss., was elected president; Dr. William A. Chapman, Cedartown, Ga., vice president, and Dr. Ambrose McCoy, Jackson, Tenn., secretary.

Southern Physicians Elect Officers.—At the eleventh annual meeting of the Southern Medical Association, held in Memphis, Tenn., November 12 to 15, the following officers were elected: president, Dr. Lewellys F. Barker, Baltimore; vice presidents, Drs. William H. Deaderick, Hot Springs, Ark., and Thomas C. Holloway, Hazard, Ky., and secretary, Dr. Seale Harris, Birmingham, Ala.; acting secretary, Dr. James R. Garber, Birmingham, Ala.; editor of the *Southern Medical Journal*, Dr. Marye Y. Dabney, Birmingham, Ala., and chairman of the executive council, Dr. Henry H. Martin, Savannah, Ga. Asheville, N. C., was selected as the place of meeting for 1918. On Sunday, the day before the opening of the convention, the pulpits of the city were filled by medical men.

FOREIGN

Deaths in the Profession Abroad.—Hugh McMinn Smellie, M.B., C.M., Edinburgh, 1886; Sanhead, Wigtownshire, Scotland; aged 60; surgeon on the Anchor Line steamships; surgeon of the *Cameronia*, when she was torpedoed and sunk in European waters; died suddenly on board the *Tuscania* in Erie Basin, Brooklyn, November 11, from heart disease.

PARIS LETTER

PARIS, Nov. 1, 1917.

The War

APPENDICITIS IN THE ARMIES IN THE FIELD

At one of the recent meetings of the Société de chirurgie de Paris, Dr. Walther, assistant professor on the Faculté de médecine de Paris, and surgeon of the hospitals, presented a memoir on this subject by Dr. Rouhier. Rouhier has been astonished at the unusual number of cases of appendicitis occurring in the armies in the field; appendicitis occurs more frequently here than among civilians of the same age. This may be explained by the conditions of life at the front: the meat diet, the free use of wine, fatigue, and exposure to wet and cold, all of which may awaken an old chronic appendicitis, and convert it into an acute case of more or less severity. These conditions may even give rise to acute intestinal affections and appendicitis, which is apparently primary. Rouhier has also been struck by the particular gravity of the attacks he has observed, perhaps the result of overexertion, which lowers the resistance to the infection. Walther does not agree with Rouhier that irregular forms of appendicitis in which the diagnosis is dubious are more frequent at the front than at the rear; perhaps they are more often overlooked on account of the difficulty of examination. On the other hand, Walther agrees with him that as soon as the diagnosis of appendicitis is made, the patient should be evacuated without delay and without relay, as would be a patient with an abdominal wound, to the surgical formation where he can be taken care of properly: operated on, if possible, and treated expectantly if the circumstances permit. Rouhier, discussing the question of immediate operation as against expectant treatment, is of the opinion that at the front, more than at the rear, intervention is indicated; but Walther declares that operation is urgently indicated in both situations alike.

Rouhier has also studied the connection between appendicitis and typhoid fever, which, he believes, predisposes to appendicitis later. One must bear in mind that frequently it is difficult to diagnosticate between appendicitis, peri-appendicitis and peri-ileotyphlitis in relation to the habitual seat of typhoid ulcerations in Peyer's patches. In closing, Rouhier mentioned a special and particularly grave form of appendicitis, that is, perforating appendicitis, occurring as the primary manifestation of typhoid fever. In one instance, within twenty-four hours the appendix became gangrenous and perforated, with a discharge of seropurulent fluid into the abdominal cavity. This was the first manifestation of the typhoid fever, which progressed steadily and finally terminated in the death of the patient in about a month.

USE OF MORPHIN BEFORE OPERATIONS AND FOR THE WOUNDED

At a recent session of the Society of Comparative Pathology, Dr. Regnault discussed the use of morphin in the wounded. Morphin is used, first, as an adjuvant to anesthesia, and, second, to dull the pains of the wounded, aside from operations. In the first case, one must make certain reservations as to that method of procedure, as it superposes two intoxications; however, that method has given good results under varying circumstances. Although of little value when given with chloroform and ethyl chlorid, there appears to be some advantage in restraining the shock which occurs during operations on large nerve trunks, when one cannot resort to Crile's method of double anesthesia, blocking the principal nerve trunks by the local injection of stovain, novocain, etc. The use of a small dose of morphin cannot be compared to the chronic intoxication which follows the

habitual use of anodynes. When local anesthesia is resorted to, 0.5 to 1 cg. of morphin, administered before the operation is begun, has yielded excellent results. The same is true of a mixture of scopolamin and morphin. The efficacy of these drugs may be increased by resorting to psychotherapy. Besides making use of morphin at operations, Regnault also gives it to relieve the pain of the wounded, especially when the kidneys and brain are intact. The toxic action of small doses of morphin is less dangerous than the shock resulting from the pain and the fatigue following sleeplessness due to pain. Pain is an antidote to morphin; a small dose of morphin acts as a general stimulant, and not as an anodyne, as do the larger doses.

Colonel Le Bel Receives the Decoration of the Legion of Honor

For reasons of health, Colonel Le Bel, physician in chief of the Canadian hospital at Saint-Cloud, has left France to return to Quebec. As an evidence of the recognition of France for the services rendered by the colonel to the French wounded, M. Justin Godart, the undersecretary of state for the army medical department, has conferred on him the cross of an officer of the Legion of Honor.

LONDON LETTER

LONDON, Nov. 6, 1917.

The War

WAR BREAD

In certain cases of disease, the government grants permits for the use of white flour; but the applications are becoming so numerous, and the necessity for economizing wheat so imperative, that it is not possible to accede to all of them. A medical subcommittee has been appointed by the Ministry of Food to deal with such cases. It finds in many cases no substantial grounds for the applications, which appear to be made merely to satisfy some whim of the patient and not because the government regulation flour has been found to be deleterious. Speaking generally, it may be said that unless some affection of the digestive organs is present which, in the opinion of the War Bread Medical Subcommittee, justifies the use of pure wheaten flour, an application cannot be granted. Thus, for instance, in acute affections of the stomach (acute gastric catarrh, ulcer in its acute stages, etc.), the use of any form of bread while the disease is at its height is probably inadmissible. During the convalescent stages the prescription of pure wheaten flour for a limited period may be permissible if rusks and breakfast biscuits or ordinary bread boiled and sieved, or bread jelly, do not meet the case. In chronic functional disorders of the stomach (which make up the majority of cases of chronic dyspepsia), the use of pure wheaten flour can rarely be allowed, for the reason that such cases are so numerous and so protracted in their course that it would be impossible to meet demands without seriously depleting the wheat supply of the rest of the population. The use of the present bread, well toasted and thoroughly chewed, or of biscuits and rusks, is recommended. In chronic organic disease of the stomach (carcinoma and chronic ulcer), white flour may sometimes be advisable, if the patient is able to take bread at all. In acute affections of the intestine (acute diarrhea, enteritis, colitis, ulcerative conditions, etc.), the same remark applies as in acute affections of the stomach. In chronic intestinal affections (chronic diarrhea, chronic colitis, malignant disease, etc.), the use of white flour may be desirable; but evidence is required to show that ordinary bread, toasted and thoroughly chewed, and the use of other measures, have failed to relieve the symptoms. Cases of disease of the nervous, circulatory or respiratory systems, or the urinary organs or skin, or such general conditions as anemia and diabetes, are considered rarely suitable for grants. As regards tuberculosis, there is no evidence that the war bread is injurious.

THE CONTROL OF VENEREAL DISEASES

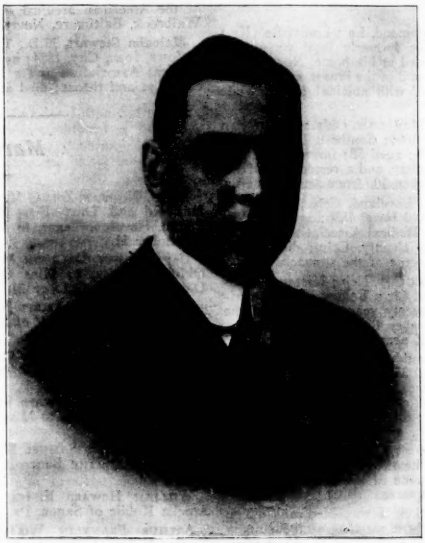
The problem of the control of venereal diseases is receiving a good deal of attention both at home and in our dominions beyond the seas. The National Council for Combating Venereal Diseases (a philanthropic body formed for this object) has adopted a resolution in which it refrains from recommending prophylaxis in the form of provision of outfits to men before sexual indulgence. At the same time it urges the importance of making arrangements for early treatment before the onset of symptoms. The Local Government Board has sent to the councils of counties and county boroughs in England and Wales a circular calling attention to putting into force the Venereal Disease Act. The purpose of the act is to prevent the treatment of venereal disease otherwise than by duly qualified physicians, and to control the supply of remedies therefor. The necessity for such a measure is shown by the report of the Royal Commission of Venereal Diseases, which stated that the continued existence of unqualified practice constitutes one of the principal hindrances to the eradication of those diseases. The act renders it illegal for any one other than a duly qualified physician for reward, either direct or indirect, to treat any person for venereal disease, or prescribe any remedy for such disease, or give any advice in connection with the treatment thereof, whether the advice is given to the person to be treated or to any other person. But this prohibition does not come into operation within any area until a scheme for the gratuitous treatment of persons in that area suffering from venereal disease has been approved by the board and is already in operation. The act prohibits advertisements, public notices and announcements (other than advertisements, notices or announcements published by any local or public authority or with the sanction of the board, or publications sent only to duly qualified physicians or to wholesale or retail chemists for the purposes of their business) with respect to the treatment of venereal disease or the prescription of remedies therefor, or the giving of advice in connection with the treatment. The act also prohibits the advertisement or recommendation to the public of any so-called remedies for venereal disease by means of any printed papers or handbills, or by labels, etc., affixed to or delivered with any packet, bottle, etc., containing any such so-called remedies.

The Federal Committee of the British Medical Association is asking the state governments in New South Wales and in South Australia to pass a venereal diseases act on similar lines to the acts of the other states of the commonwealth described in the previous letter to THE JOURNAL. This committee is divided in opinion on the question of the advisability of making more widely known precautions for the prevention of venereal diseases that may be taken by those who have exposed themselves to the risk of infection. In Queensland and in Western Australia, physicians have not reported anything approaching the number of cases of venereal disease that must have occurred. The defense department in Australia has given facilities to civil practitioners to obtain special experience in the treatment of venereal disease by attendance at military venereal disease hospitals and camps. In Queensland the health amending act, 1917, gives the commissioner, instead of the governor-in-council, power to make regulations for the treatment of venereal diseases and for the establishment, management and control of dispensaries or other places for gratuitous treatment. No one must treat venereal diseases except a physician; but the commissioner may grant a permit to a pharmacist to prescribe if a physician is not available. In South Australia, the government is well satisfied with the night clinics for venereal disease. In Victoria the minister of health is appointing a venereal diseases advisory committee to assist in administering the Venereal Diseases Act. The sale by pharmacists of any "patent" or proprietary medicine specially recommended is prohibited for the treatment of any venereal disease. The following are specifically mentioned: hydrargyrum cum creta or its admixtures; red mercuric iodid; mercury tannate; mercuric cyanid in pill or tablet form; sandalwood oil or its derivatives; copaiba or its derivatives, in the form of emulsion or capsules; kharsivan (British salvarsan); argyrol; gray oil or similar mercurial emulsions; methylene blue in pills, tablets or capsules; medicated bougies, and gonococcus vaccines and serums. Every person suffering from venereal disease or suspected of so suffering must consult at regular intervals a physician, who shall deliver a warning notice of the penalties involved, and a booklet issued by the public health department, "Information Relating to Venereal Diseases." No person suffering from venereal disease shall carry, deliver, manufacture, prepare, or otherwise handle food intended for consumption by any other person. Precautions must be observed by individuals in the care of children.

The Medical Service of the Australasian forces in Egypt has established a prophylactic tent at the entrance of each camp where men who have exposed themselves to infection can be disinfected. These disinfections have been so successful that in a series of 2,000 cases only three men developed disease. In the first month after the introduction of the system, of 432 men who were treated, not one developed disease, while of thirty-five men who developed disease, not one visited the tent.

Deaths

Major Richard Weil, M. R. C., U. S. Army, New York City; College of Physicians and Surgeons in the City of New York, 1900; aged 41; died in the base hospital at Camp Joseph Wheeler, Macon, Ga., November 19, from pneumonia. Dr. Weil was one of the recognized leaders in American cancer research. He was a Fellow of the American Medical Association, and a member of the American Association of Pathology and Bacteriology; he was also visiting physician to Mount Sinai Hospital, and the Montefiore Home, New York City. Since 1906, Dr. Weil had been an active member of the Huntington Fund, and constantly engaged in the problems of cancer research. His contributions in the field of serology of cancer and in the general problems of immunity have gained for him an international reputation; he was one of the founders of the American Association of Cancer Research, and was one of the founders and editor-in-chief of the *Journal of Cancer Research*. At the reorganization of the Memorial Hospital in 1913, Dr. Weil became assistant director in cancer research and attending physician to the hospital, and labored energetically to establish an efficient and routine work of the institution. On his appointment as professor of experimental medicine in Cornell University in 1915, he resigned as assistant director of the Memorial Hospital, but continued without interruption his experimental work in cancer. On the declaration of war, he was one of the first to offer his services to the government, and spent the summer at the Medical Officers Training Camp, Fort Benjamin Harrison, Ind., and only a short time ago was detailed as chief of the medical staff of the base hospital at Camp Joseph Wheeler, Macon, Ga., and there he died. At a meeting of the board of trustees of the Memorial Hospital, resolutions were adopted setting forth the attainments of Major Weil, and closing with the following paragraph: "During his brief but brilliant carrer he attained eminence as a devoted laboratory worker, a skilful experimenter, a broadly trained clinician, and a forceful writer, while his untimely death places his name among the first on his Country's honor roll in the Great War."



Died in the Service.

LIEUT. ORLANDO M. GOCHNAUR, M. R. C., U. S. Army

Lieut. Orlando Merrill Gochnaur, M. R. C., U. S. Army, Freeport, Ill.; College of Physicians and Surgeons, Chicago, 1915; intern in the Calumet and Hecla Hospital, Calumet, Mich., and later in the Henrotin Memorial Hospital, Chicago; who went to France in September, and was on duty with the British forces in Flanders, is reported to have been killed in action, November 6.

Franklin Paine Mall, M.D., Baltimore; University of Michigan, Ann Arbor, 1883; aged 55; a member of the American Association of Anatomy; a fellow in 1886-1888, and instructor in pathology, 1888-1889, in Johns Hopkins University; adjunct professor of vertebrate anatomy in Clark University, Worcester, Mass., in 1889-1892; professor of anatomy in the University of Chicago, 1892-1893, and since that time professor of anatomy in Johns Hopkins University; who was made director of the Department of Embryology in the Carnegie Institution, Washington, D. C., in 1915; a distinguished anatomist, and a member of many learned societies; a prolific contributor to the literature of his specialty; joint editor of the *Handbuch der Entwicklungsgeschichte des Menschen;* co-editor and one of the founders of the *American Journal of Anatomy* and the *Anatomical Record;* associate editor of the *Journal of Morphology,* and editor of *Studies from the Anatomical Laboratory of Johns Hopkins University;* died in Johns Hopkins Hospital, Baltimore, November 17, after a surgical operation.

James Henry Honan, M.D., Augusta, Ga.; Rush Medical College, 1895; Royal University, Berlin, Germany, 1897; aged 58; an honorary Fellow of the American Medical Association; a specialist in cardiovascular diseases, and from 1909 until the outbreak of the war a practitioner of Berlin and Bad-Nauheim; professor of diseases of the heart and circulatory system in the University of Georgia, Augusta; formerly local surgeon of the Erie Railway; author of a Hand Book of Medical Europe, and a number of treatises on cardiovascular conditions; died at his home, November 11. As a tribute of respect to his memory the Medical College of the University of Georgia was closed on Wednesday, November 14, and the faculty attended the funeral in a body.

Francis LeRoy Satterlee, M.D., New York City; New York University, New York City, 1868; aged 70; a Fellow of the American Medical Association, and New York Academy of Medicine, and a member of the New York Pathological Society; professor of chemistry, materia medica and therapeutics in the New York College of Dentistry since 1869; lecturer on agricultural chemistry and hygiene in the New York College of Veterinary Surgery since 1870; lecturer on physiology and hygiene in his alma mater; for many years major and surgeon of the Eighty-Fourth Infantry, N. G., N. Y., and for eighteen years surgeon to the New York Police Department; attending physician to St. Elizabeth's Hospital; died at his home, November 12, from heart disease.

William Keener Sutherlin, M.D., Shreveport, La.; New York University, New York City, 1881; Kaiser Wilhelm University, Berlin, Germany, 1897; aged 58; formerly a Fellow of the American Medical Association, and once vice president of the Louisiana State Medical Association; a well-known surgeon, and proprietor of Sutherlin's Sanatorium, Shreveport; died in the Schumpert Sanitarium, Shreveport, November 10, from pneumonia.

William Boardman Reed, M.D., Alhambra, Calif., University of Pennsylvania, Philadelphia, 1878; aged 75; formerly a Fellow of the American Medical Association; a veteran of the Civil War, and a well known specialist on diseases of the digestive system; for many years a resident of Atlantic City, N. J.; at one time a member of the editorial staff of the Philadelphia *Press;* who went to California on account of ill health in 1909, and suffered a cerebral hemorrhage in 1913; died at his home, October 31.

John Zebulon Currie, M.D., Cambridge, Mass.; Harvard Medical School, 1873; University of Edinburgh, Scotland, 1874; aged 70; a Fellow of the American Medical Association; physician to the New England Baptist Home for Aged People; died suddenly, from heart disease, November 11, while in his automobile in East Arlington, Mass.

Mary O'Brien Porter, M.D., Chicago; Kansas Medical College, Topeka, 1899; Northwestern University Woman's Medical School, Chicago, 1901; aged 47; a member of the Illinois State Medical Society, and a member of the staff of the Psychopathic Laboratory for the Municipal Courts; died at her home, November 18, from pneumonia.

Thomas Howard Marable, M.D., Clarksville, Tenn.; New York University, New York City, 1878; aged 61; a Fellow of the American Medical Association; mayor of Clarksville;

president of the Tennessee State Medical Association, 1898, and of the Clarksville Academy of Medicine from 1891 to 1893; a specialist in obstetrics; professor of obstetrics in the University of Tennessee, Nashville; died at his home, November 12.

William Gibson Craig, M.D., Springfield, Mass.; Jefferson Medical College, 1892; aged 49; a Fellow of the American Medical Association, and a member of the American Ophthalmological Association; a specialist on diseases of the eye and ear; ophthalmic and aural surgeon to Mercy Hospital, Springfield; died at his home, November 15.

Burrell A. Fletcher, M.D., Augusta, Ark.; Bellevue Hospital Medical College, 1884; aged 55; formerly a Fellow of the American Medical Association; a member of the Arkansas Medical Society, and president of the Arkansas State Board of Health; died in St. Joseph's Hospital, Memphis, Tenn., November 15.

Ira F. Gose, M.D., Eureka, Utah; College of Physicians and Surgeons, Baltimore, 1896; aged 44; formerly a member of the American Medical Association; who was injured when his automobile overturned near Santaquin, November 10; died from his injuries in the Provo (Utah) General Hospital, November 12.

William E. Henkel, M.D., Hammond, La.; Louisville (Ky.) Medical College, 1885; aged 66; formerly local surgeon of the Illinois Central Railroad; died at his home, November 9, from the effects of a gunshot wound of the breast, self-inflicted two days before, it is believed, with suicidal intent, while despondent.

Ansel Jerome Robbins, M.D., McAlester, Okla.; Georgetown University, Washington, D. C., 1891; Southern Homeopathic Medical College, Baltimore, 1896; aged 58; formerly a member of the Arkansas Medical Society, and a resident of Mena, Ark.; died at his home, September 10, from acute gastritis.

William B. Sutherland, M.D., Loveland, Colo.; College of Physicians and Surgeons, Keokuk, Iowa, 1876; aged 66; formerly a Fellow of the American Medical Association; founder of the first hospital in Larimer County, Colo.; died at his home, November 14, from carcinoma of the stomach.

Claude Watson, M.D., Nebraska City, Neb.; Missouri Medical College, St. Louis, 1877; aged 62; a Fellow of the American Medical Association; for twenty years president of the board of education; died, November 16, from heart disease, while making a professional call near Dunbar, Neb.

Alvin Roy Peebles, M.D., Boulder, Colo.; University of Michigan, Ann Arbor, 1905; aged 33; a Fellow of the American Medical Association; professor of preventive and experimental medicine and director of clinical laboratories in the University of Colorado, Boulder; died, October 22.

Jason T. Wallace, M.D., Oneida, N. Y.; New York Homeopathic Medical College, New York City, 1865; aged 81; a member of the first board of education and of the board of health of Oneida; died at the home of his daughter in that city, November 16, from heart disease.

Jacob Cullen Barr, M.D., Keokuk, Iowa; Medical College of Ohio, 1857; aged 87; formerly a member of the Illinois State Medical Society; major and surgeon of the First Ohio Infantry throughout the Civil War; died at his home, November 13, from cerebral hemorrhage.

Jesse D. Elliott, M.D., Hawleyville, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1882; aged 65; a member of the Iowa State Medical Society; for one term a member of the state senate; died in a hospital in Moline, Ill., November 11, from malignant disease.

Julius M. Wilhelm, M.D., Traverse City, Mich.; University of Pennsylvania, Philadelphia, 1895; aged 55; a Fellow of the American Medical Association; a veteran of the war with Spain; local surgeon for the Pere Marquette Railroad; died at his home, November 14.

Frank M. Winchester, M.D., Charlotte, N. C.; Jefferson Medical College, 1883; aged 60; formerly a Fellow of the American Medical Association; professor of obstetrics in the North Carolina Medical College, Charlotte; died at his home, November 11.

Frank Blair Lovell, M.D., Gibson City, Ill.; Rush Medical College, 1888; Bellevue Hospital Medical College, 1893; aged 51; a Fellow of the American Medical Association; died in the Presbyterian Hospital, Chicago, November 11, from typhoid fever.

Frank Henry Columbus Zornow, M.D., Pittsford, N. Y.; New York Homeopathic Medical College; New York City, 1917; aged 24; an intern in the Rochester (N. Y.) Homeopathic Hospital; died in that institution, October 25, from diphtheria.

William Fletcher Jolley, M.D., Troupsburg, N. Y.; Eclectic Medical College of Pennsylvania, Philadelphia, 1869; aged 69; a member of the Medical Society of the State of New York; died in the Canandaigua (N. Y.) Health Home, November 8.

Harrison Gabel, M.D., Centerville, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1880; aged 76; formerly a member of the Indiana State Medical Association; died at his home, November 15, from valvular heart disease.

George Edward Turrill, M.D., Cleveland; Homeopathic Hospital College, Cleveland, 1879; aged 63; at one time a member of the staff of the Huron Road Hospital, Cleveland; died at his home, November 13, from cerebral hemorrhage.

William Henry Harrison Asbury, M.D., Clay City, Ind.; Medical College of Ohio, Cincinnati, 1875; aged 77; died in the Post-Graduate Hospital, Chicago, November 11, from hemorrhage, six weeks after operation for prostatectomy.

Louis Charles Winternitz, Baltimore (license, Maryland); a practitioner for fifty-two years; aged 74; formerly a Fellow of the American Medical Association; died at his home in Walbrook, Baltimore, November 9, from senile debility.

Malcolm Stewart, M.D., Tesumseh, Neb.; State University of Iowa, Iowa City, 1884; aged 59; a Fellow of the American Medical Association and a specialist in diseases of the eye, ear, nose and throat; died at his home, November 14.

Marriages

LIEUT. NORMAN ZOLLA, M. C., Ill. N. G., assigned to One Hundred and Thirty-First Field Hospital Company, Camp Logan, Houston, Texas, to Miss Mary McGinty of Chicago, November 11.

CAPT. GEORGE DAVIDSON MCLEAN, M. R. C., U. S. Army, Oklahoma City, to Miss Ruth Elizabeth Barnes, also of Oklahoma City, October 21.

LIEUT. HAROLD BARTLETT JOHNSON, M. R. C., U. S. Army, to Miss Maxine Crockett of Nashville, Tenn., in Chattanooga, Tenn., November 3.

EDWARD R. M. PENNYPACKER, M.D., Scranton, Pa., to Mrs. Vilette Windett Overly, formerly of Chicago, at Salt Lake City, recently.

LIEUT. STANLEY EDWARD STRAUBE, M. R. C., U. S. Army, Fort Oglethorpe, Ga., to Miss Sarah Rollow of Edgoten, Ky., recently.

LIEUT. RICHARD SAMUEL MAGEE, M. R. C., U. S. Army, to Miss S. Marguerite Bancroft, both of Altoona, Pa., November 16.

WILLIAM HOWARD EISTER, M.D., Sunbury, Pa., to Miss Amelia Kublic of Sagon, Pa., at Shamokin, Pa., November 7.

ARTHUR FRANKLIN WOLFORD, M.D., Chicago, to Miss Nadine Wiley of Moberly, Mo., at Chicago, November 7.

LIEUT. ALBRO L. PARSONS, M. R. C., U. S. Army, to Miss Katherine Barnett, both of Louisville, Ky., November 20.

SAMUEL SHELTON WATKINS, M.D., Baltimore, to Miss Mary Townsend of Bowling Green, Ky., November 10.

WILBUR ARTHUR BAKER, M.D., Kansas City, Mo., to Miss Olivia Olsson of Lawrence, Kan., November 3.

FLOYD OWEN WOODWARD, M.D., to Miss Alice Margaret Hewson, both of Minneapolis, November 14.

DANIEL CLARK BRENNAN, M.D., to Miss Josephine Agnes Winum, both of Akron, Ohio, November 6.

RICHARDS ELLISON AMOS, M.D., Akron, Ohio, to Miss Hazel McCauley of Ironton, Ohio, November 10.

BENONI AUSTIN PLACE, M.D., Great Falls, Mont., to Miss Margaret Powell of Clarion, Pa., recently.

OSCAR WALTER REST, M.D., Chicago, to Miss Dora Lucile Lake of Madison, Wis., November 21.

ALFRED MOORE, M.D., to Miss Eva McCleskey, both of Memphis, Tenn., November 21.

JAMES F. GARD, M.D., to Mrs. Sarah A. Mooney, both of Carthage, Mo., November 7.

KARL ALBERT MEYER, M.D., to Miss Faye Hart, both of Chicago, November 11.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SOME MISBRANDED MINERAL WATERS

Baldwin Cayuga Mineral Water.—Lucius Baldwin & Son, Cayuga, N. Y., shipped in interstate commerce 60 half-gallon bottles of Baldwin Cayuga Mineral Water. The label claimed that the water was a cure for Bright's disease, diabetes, all kidney afflictions, liver complaints, dyspepsia, all affections of the bladder, all forms of rheumatism and all skin diseases besides being a "Wonderful Tonic for General Debility." These claims the government held were false and fraudulent, and furthermore declared the water was adulterated because "it consisted in whole or in part of a filthy, putrid or decomposed substance." Lucius Baldwin & Son, claimants, consented to a decree, and judgment of condemnation and forfeiture was entered and the court ordered that the water should be destroyed.—[*Notice of Judgment No. 4894.*]

Bowden Lithia Water.—The Bowden Lithia Springs Water Co., an Atlanta, Ga., corporation, shipped a quantity of "Bowden Lithia Water" which was misbranded. Analysis showed this product to be another one of the so-called lithia waters containing practically no lithium. The company pleaded guilty and was fined $50.—[*Notice of Judgment No. 4319.*]

Carbonated Colfax Mineral Water.—The federal authorities filed a libel for the seizure and condemnation of 1,200 bottles of mineral water consigned by D. C. Fry & Co., Inc., Colfax, Iowa. The officials charged that the water was adulterated; as chemical and bacteriologic examination showed it to be polluted and containing excessive numbers of bacteria. It was declared misbranded, first, because it was called a "carbonated" water when, as a matter of fact, it was artificially carbonated and, second, because the following false and fraudulent claims were made regarding its alleged curative value:

"This water is an infallible remedy for all diseases of the liver, kidneys, and blood. It cures constipation and is the most pleasant and certain promoter of digestion known. Nature's remedy for the cure of every form of indigestion or dyspepsia and acute and chronic rheumatism and now acknowledged to be the most wonderful specific for kidney affections yet discovered."

The government declared that the water contained no ingredients or combination of ingredients capable of producing such therapeutic effects. D. C. Fry & Co., Inc., appeared as claimant and, having interposed no objection to a decree, judgment of condemnation and forfeiture was entered, and the court ordered that the water should be destroyed, that the cases and bottles should be returned to the claimant and that the claimant should pay the costs of the proceedings.—[*Notice of Judgment No. 4888.*]

Chippewa Natural Spring Water.—The government filed a libel for the seizure and condemnation of 3,420 bottles, each containing one-half gallon of "Chippewa Natural Spring Water," sold by the Chippewa Springs Corporation, Chippewa Falls, Wis., charging that the product was misbranded. The label declared in part that this matter was "Beneficial and Remedial in cases of Typhoid Fever, Kidney Diseases, Rheumatism, Gout, Constipation, Indigestion, Headache, etc." These claims the government declared were "feloniously and fraudulently made with the intention to create the impression that the article was efficacious for the treatment of the diseases mentioned, whereas, it contained no ingredient or combination of ingredients capable of producing the therapeutic effects claimed." No claimant appeared for the property and the court entered judgment of condemnation and forfeiture, and ordered that the product should be redelivered to the Chippewa Springs Co., on payment of all the costs of the proceedings and the execution of a bond in the sum of $50.—[*Notice of Judgment No. 4726.*]

Crazy Mineral Water.—One hundred and twenty half-gallon bottles of a water labeled "Crazy No. 3" were declared adulterated by the federal authorities. According to the officials this water which, according to the label, was the product of the Crazy Well Water Company, Mineral Wells, Texas, was adulterated because it contained a filthy, decomposed and putrid animal substance. No claimant appeared, and judgment of condemnation and forfeiture was entered and the court ordered that the product should be destroyed.—[*Notice of Judgment No. 4234.*]

Crystal Lithium Springs Water.—George W. Hamilton, who did business as the Crystal Lithia Water Co., Excelsior Springs, Mo., shipped in interstate commerce a quantity of "Crystal Lithium Spring Water," which was declared adulterated and misbranded. Misbranding was alleged because the label claimed that each gallon of the water contained over 2 grains of lithium chlorid when, as a matter of fact, it contained little, if any, lithium chlorid. Further, the claim that the product was the "Best Water in the Treatment of Bright's Disease, Diabetes . . . Rheumatism and Gravel" was declared recklessly and wantonly false and fraudulent. Adulteration was charged in that the product contained filthy, decomposed and putrid animal or vegetable matter. Hamilton pleaded guilty and was fined $100 and costs.—[*Notice of Judgment No. 4174.*]

Gray Mineral Water.—William Baird and William A. Baird, trading as William Baird & Son, Cambridge Springs, Pa., shipped in interstate commerce a quantity of Gray Mineral Water which the federal authorities declared misbranded. The statement on the label that this product was "Nature's Own Cure" for all diseases of the stomach, liver, bowels and urinary organs, also rheumatism, neuralgia, nervous disorders, etc., was declared false and fraudulent and made in reckless and wanton disregard of its truth or falsity. It was further charged that the claims that Gray Mineral Water was "America's choicest table water unequaled in its crystal clearness, pleasant taste and absolute purity" were false and misleading in that they indicated that the product was a natural mineral water when in fact it was an artificially carbonated mineral water. The government charged further that the claim that the product was "bottled at the Spring" was false and misleading because it indicated that the article was bottled at Gray Mineral Spring when in fact it was not. Finally, misbranding was alleged for the further reason that the quantity of the contents was not plainly and conspicuously marked on the outside of the package. The defendants pleaded guilty and were fined $20 and costs.—[*Notice of Judgment No. 4733.*]

Henk Waukesha Mineral Spring Water.—The Henk Mineral Spring Co., Waukesha, Wis., was the trade name under which Margaret K., Arthur W., Emma, Clarence E. and Mabel Henk operated as co-partners in the sale of "Henk Waukesha Mineral Spring Water." The federal authorities proceeded against these individuals on the ground that their product was misbranded. The government held that the claim that Henk Waukesha Mineral Spring Water "is a most effective remedy for all kidney ailments, Bright's disease in its incipiency" was false and fraudulent and made knowingly and in reckless and wanton disregard of its truth or falsity, because in truth and in fact the water did not contain ingredients or medicinal agents effective as a remedy for all kidney ailments or as a remedy for Bright's disease in its incipiency or at any stage. The defendants pleaded guilty and each was fined $25, making an aggregate of $125.—[*Notice of Judgment No. 4858.*]

Seawright Magnesian Lithia Water.—A libel was filed for the seizure and condemnation of 1,656 bottles of "Seawright Magnesian Lithia Water" which were labeled in part "Seawright Magnesian Lithia Spring Co., Nature's Nervine. E. R. Edmondson, manager, Staunton, Va." Misbranding was

alleged. The following therapeutic claims appeared on the bottle:

"Quiets the nerves and induces sleep. Invaluable in all diseases of the Stomach, Liver or Kidneys, Stone in the Bladder, etc. Relieves Dyspepsia, Constipation, Rheumatism, Gout, etc. A sure remedy for Eruptions and all Diseases of the Skin, Ulcerated Stomach, Sore Eyes, etc."

Misbranding was alleged, first, in that the water did not contain enough lithium to entitle it to be designated as a lithia water; second, it "did not contain any ingredients or combination of ingredients capable of producing the therapeutic effects claimed for it." No claimant having appeared, judgment of condemnation and forfeiture was entered and the court ordered that the product should be destroyed.—[*Notice of Judgment No. 3714.*]

White Stone Lithia Water.—Lloyd C. Dillard of Spartanburg, S. C., the Bank of Spartanburg, the Merchants and Farmers' Bank and the First National Bank were charged by the federal authorities with shipping in violation of the Food and Drugs Act "White Stone Lithia Water" which was misbranded. The charge was based on the fact that the name indicated to the purchaser that the product was lithia water when in fact it was not. Moreover, the label represented that it was a cure for all liver, kidney and bladder troubles, rheumatism, gout, all blood diseases and indigestion. These claims the government declared false and fraudulent. L. C. Dillard, the Bank of Spartanburg, the Merchants and Farmers' Bank and the First National Bank pleaded guilty and the court imposed a fine of $10—or $2.50 each.—[*Notice of Judgment No. 4869.*]

Witter Springs Water.—The government filed a libel for the seizure and condemnation of 324 bottles of Witter Springs Water of the Witter Medicinal Springs, San Francisco, Calif. The officials charged that the water was adulterated in that it consisted in whole or in part of a filthy, decomposed and putrid animal or vegetable substance. No claimant appeared and it was adjudged condemned and forfeited and the court ordered that the product should be destroyed.—[*Notice of Judgment No. 4296.*]

Correspondence

CORNEAL TATTOOING

To the Editor:—THE JOURNAL has recently published two contributions on corneal tattooing. It seems to me that almost ideal results can be obtained by a modified Froehlich method, which I have followed in several cases. A von Hippel trephine is used to outline the area to be stained, cutting only through the epithelium and upper lamellae of the cornea. With a keratome this is carefully dissected loose, leaving the flap hanging at one side by a small hinge of tissue. The India or Chinese ink emulsion, worked up in a mercuric chlorid solution, is now applied and the flap turned back in place. A beautiful black round pupil remains. If the operation is performed in this manner, the stain is permanent, as can be shown in a case in which it was done six years ago. Dr. Allport's method is very similar excepting for his failure to replace the epithelium, which protects the color more strongly.

JESSE S. WYLER, M.D., Cincinnnti.

LOCALIZATION OF FOREIGN BODIES

To the Editor:—In THE JOURNAL, Nov. 3, 1917, p. 1521, Dr. Sinclair Tousey details a method of localization of foreign bodies. On account of his prominence as an author, Dr. Tousey having written a very valuable compilation on the roentgen ray, I think that it is unsafe to let the article referred to pass without question.

Dr. Tousey states that by means of a grating laid on the plate, which merely serves the purpose of a scale for the measurement of the displacement of the shadow cast by a foreign body when the source of illumination casting the shadow is moved, the tube being placed at a distance from the plate of 21 inches and the tube shift of 3 inches being employed, he is able to read from the plate without calculation the actual distance of the foreign body casting a shadow from the surface of the plate.

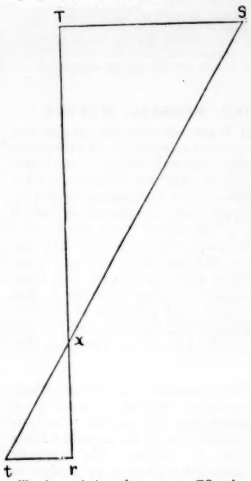


Fig. 1.—Relation of traverses: *TS*, tube traverse; *tr*, traverse of foreign body; *Tr*, axial plate distance; *xx*, height of foreign body.

$$TS:tr::Tr-xx:xx$$

COMPARISON IN INCHES

Foreign Body Traverse	Depth—Tousey	Depth—Actual
½	0.5	0.9
¾	1.5	2.6
1	3.5	5.25
1¾	5.0	6.7
2	7	8.4
3	10.5	10.5
4	14.0	12.5

He further states that a shadow traverse of ½ inch with tube at 21 inches and tube shift at 3 inches is equal to ½ inch distance from plate to foreign body; that for each additional ½ inch shadow traverse an additional ½ inch should be added to this height or depth according as the tube is over or under the patient. This statement is true when the foreign body keeps such a position that its traverse is exactly 3 inches, and under those circumstances it will be found to be exactly midway between the anode of the tube and the surface of the plate. In such circumstances the relation is true because two right angled triangles whose elevations are equal must have equal bases. It is not true for any other position of a foreign body, and the error in such circumstances is enormous.

Dr. Tousey assumes that the relations here represented may be shown by a simple arithmetical progression, and that

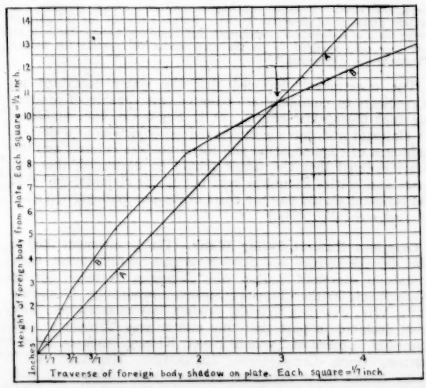


Fig. 2.—Comparison of graphs: *A*, Tousey's curve; *B*, actual curve; arrow indicates point at which Tousey's statement is true; anode plate distance, 21 inches; tube shift, 3 inches.

if a graph were constructed having foreign body shadow traverse as ordinates, and depth of body in the tissue as abscissas, the relation curve would be a straight line. It

will be found, however, that the line representing this relation is a parabola, which is quite easily constructed.

The true proposition is as follows: Let TS equal tube shift; TR, traverse of the foreign body; AD, anodal plate distance or distance from anode of the tube to the surface of the plate, and X, elevation of foreign body in space above plate. Then $Ts: Tr = AD - x: x$.

All that is necessary in order to prove the incorrectness of Dr. Tousey's statement is to assume that the foreign body in Tousey's case has a traverse on the plate of 1 inch. Then by his statement, with a distance of 21 inches and a tube shift of 3 inches this foreign body would lie 7½ inches or 3½ inches in the tissues; whereas, if you solve the equation you will find that the foreign body must occupy a position 5¼ inches from the plate, making an error of 1¾ inches.

GEORGE C. JOHNSTON, M.D., Pittsburgh.
Major, M. R. C., Pittsburgh School of Military Roentgenology.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

COLORADO: Denver, Jan. 8. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DELAWARE: Wilmington, Dec. 11-13. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

DISTRICT OF COLUMBIA: Washington, Jan. 8. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

FLORIDA: Jacksonville, Dec. 4-5. Sec., Dr. W. M. Rowlett, Citizens Bank Bldg., Tampa.

HAWAII: Honolulu, Jan. 10-13. Sec., Dr. G. A. Batten, Box 375, Honolulu.

INDIANA: Indianapolis, Jan. 8-10. Sec., Dr. Wm. T. Gott, 84 State House, Indianapolis.

KENTUCKY: Louisville, Dec. 4-6. Sec., Dr. A. T. McCormack, Bowling Green.

LOUISIANA: New Orleans, Dec. 6-8. Sec. Pro-tem., Dr. E. W. Mahler, 730 Audubon Bldg., New Orleans.

MARYLAND: Baltimore, Dec. 11. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

MINNESOTA: St. Paul, Jan. 2-4. Sec., Dr. Thomas McDavitt, 741 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, Dec. 17-19. Sec., Dr. George H. Jones, 206 Washington St., Jefferson City.

NATIONAL BOARD OF MEDICAL EXAMINERS: New York City, Jan. 9-17. Sec., Dr. J. S. Rodman, 310 Real Estate Bldg., Broad and Chestnut Sts., Philadelphia.

NEW HAMPSHIRE: Concord, Dec. 10-12. Sec., Dr. W. T. Crosby, Beacon Bldg., Manchester.

NEW MEXICO: Sante Fe, Jan. 14. Sec., Dr. R. K. McClanahan, East Las Vegas.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

OHIO: Columbus, Dec. 4-6. Sec. Pro-tem., Dr. Herbert M. Platter, 185 E. State St., Columbus.

OKLAHOMA: Oklahoma City, Jan. 8-9. Sec., Dr. J. J. Williams, Weatherford.

OREGON: Portland, Jan. 1. Sec., Dr. Herbert S. Nichols, Portland.

PENNSYLVANIA: Philadelphia, Jan. 8-10. Sec., Nathan C. Schaeffer, State Capitol, Harrisburg.

RHODE ISLAND: Providence, Jan. 3. Sec., Dr. B. U. Richards, State House, Providence.

SOUTH DAKOTA: Pierre, Jan. 8. Sec., Dr. P. B. Jenkins, Waubay.

UTAH: Salt Lake City, Jan. 7-8. Cor. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

VIRGINIA: Richmond, Dec. 11-14. Sec., Dr. J. W. Preston, McBain Bldg., Roanoke.

WASHINGTON: Spokane, Jan. 1. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 14. Sec., Dr. J. M. Dodd, 220 E. Second St., Ashland.

Texas June Examination

Dr. M. F. Bettencourt, secretary of the Texas State Board of Medical Examiners, reports the written examination held at Austin, June 19-21, 1917. The examination covered 12 subjects and included 120 questions. An average of 75 per cent. was required to pass. Of the 119 candidates examined, 115, including 9 osteopaths, passed and 4 failed. Forty-one candidates, including 2 osteopaths, were licensed through reciprocity, and 8 candidates were granted reregistration certificates. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Physicians and Surgeons, Los Angeles		(1917)	90
Rush Medical College		(1916)	90
University of Illinois		(1917)	80
University of Louisville		(1917)	80
Tulane University of Louisiana		(1916)80, 80, 90; (1917)	80, 80
Boston University		(1909)	80
St. Louis College of Physicians and Surgeons		(1914)	80
University of Pennsylvania		(1917)	90
Meharry Medical College (1916) 75; (1917) 75, 80, 80, 80, 80, 80, 80, 80.			
University of Tennessee (1917) 80, 80, 80.			
Vanderbilt University (1889) 75; (1917) 80, 80, 80, 90.			
Baylor University (1910) 75; (1916) 75, 75, 80; (1917) 80, 80, 80, 80, 80, 80, 80, 80, 90.			
Fort Worth School of Medicine (1917) 75, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 90, 90, 90.			
University of Texas, (1916) 80, 90; (1917) 75, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 80, 90, 90, 90, 90, 90, 90, 90, 90, 90.			
National School of Medicine, Mexico		(1895) 75; (1900)	75
		(1913)	80
School of Medicine of San Luis Potosi		(1908) 80; (1917)	75
	FAILED		
Meharry Medical College		(1912) 71; (1915)	66.3
University of Tennessee		(1916)	71.1
Baylor University		(1917)	65.3
College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Arkansas Industrial University		(1898)	Arkansas
College of Physicians and Surgeons, Little Rock		(1909)	Oklahoma
University of Arkansas		(1912)	Arkansas
Atlanta College of Physicians and Surgeons		(1909)	Georgia
Atlanta Medical College		(1916, 2)	Georgia
Georgia College of Eclectic Med. and Surgery (1895)		(1909)	Georgia
American College of Medicine and Surgery		(1906)	Nebraska
Chicago Hospital College of Medicine		(1915)	Arkansas
College of Physicians and Surgeons, Chicago		(1906)	Kansas
Northwestern University		(1894)	Nevada
Keokuk Medical College		(1895)	Missouri
Hospital College of Medicine		(1880)	Kentucky
University of Louisville		(1904) Oklahoma; (1909)	Tennessee
		(1915)	Kentucky
Johns Hopkins University		(1914)	Virginia
University of Maryland		(1907)	Maryland
University of Minnesota		(1894)	Minnesota
Barnes Medical College		(1893)	Oklahoma
Kansas City Medical College		(1901) Kansas; (1903)	Missouri
St. Louis University		(1905)	Oklahoma
University Medical College of Kansas City		(1904)	Missouri
Eclectic Medical College		(1892)	Ohio
Meharry Medical College (1913) Oklahoma; (1915) Kentucky,			Tennessee
Memphis Hospital Medical College		(1902)	Mississippi
		(1910)	Oklahoma
University of Tennessee		(1893) Tennessee; (1914)	Mississippi
Vanderbilt University		(1888) Arkansas; (1900)	Tennessee
		(1913) Mississippi; (1916, 2)	Tennessee
University of Vermont		(1904)	Vermont

Delaware June Examination

Dr. H. W. Briggs, secretary of the Medical Council of Delaware, reports the written and practical examination held at Wilmington, June 19-21, 1917. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Nine candidates were examined, all of whom passed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Johns Hopkins University		(1916)	85.9
New York Homeo. Medical Coll. and Flower Hospital		(1917)	88, 90
Jefferson Medical College, of Philadelphia (1916) 89.1,		(1917)	83, 86.7
Medico-Chirurgical College of Philadelphia		(1916)	80.6, 86.7
Temple University		(1917)	80.5
College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Pennsylvania		(1898) (1913)	Penna.

Oregon July Examination

Dr. H. S. Nichols, secretary of the Oregon State Board of Medical Examiners, reports the written examination held at Portland, July 5-7, 1917. The examination covered 15 subjects and included 104 questions. An average of 75 per cent. was required to pass. Of the 21 candidates examined, 18, including 1 osteopath, passed, and 3, including 2 osteopaths failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Physicians and Surgeons, San Francisco		(1916)	83
Chaddock School of Medicine		(1887)	76
Northwestern University		(1902)	80
Keokuk Medical College		(1893)	76
Maryland Medical College		(1905)	77
Johns Hopkins University		(1917)	90
Harvard University		(1912)	80
St. Louis University		(1905)	76
Washington University		(1901)	81
Cincinnati College of Medicine and Surgery		(1900)	78
University of Oregon (1917) 80, 81, 83.			
Willamette University		(1906)	76
Jefferson Medical College of Philadelphia		(1902) 79; (1915)	77
Tennessee Medical College		(1901)	75
	FAILED		
John A. Creighton Medical College		(1917)	86

Book Notices

OBSTETRICS: A TEXT-BOOK FOR THE USE OF STUDENTS OR PRACTITIONERS. By J. Whitridge Williams, Professor of Obstetrics, Johns Hopkins University. Fourth Edition. Cloth. Price, $7 net. Pp. 1029, with 708 illustrations. New York: D. Appleton & Co., 1917.

Five years have elapsed since the appearance of the last edition of this book. During that time, notable changes have taken place in the views held on some phases of obstetrics, even though no definite progress has been made. The author discusses this phase of the subject, and expresses opinions which, coming from a man of his standing, are not only worthy of consideration, but are significant and weight-bearing. Anesthesia in obstetrics has received much attention during the past five years. Williams endorses the use of nitrous oxid gas, but feels that it should be limited to the second stage. As for scopolamin-morphin anesthesia, he says the fact that we cannot promise a satisfactory subjective result to more than three patients out of four makes it apparent that the method is not ideal. He believes that it will gradually fall into disuse, or at least that its use will be restricted to a small group of neurotic patients. From his experience the method is not adapted to private practice. He is strongly opposed to lumbar anesthesia. His preference in normal labor is chloroform. The value of complicated chemical methods in determining the prognosis and treatment of preeclamptic toxemia and eclampsia is discounted by the author. He says that while the clinical differentiation between the nephritic and the preeclamptic types of toxemia is not always easy, fortunately the difficulty in diagnosis is of more importance from the scientific than from the practical point of view, as the treatment to be employed is identical in the two cases. While he regards the Abderhalden pregnancy reaction as one of the important recent contributions to medicine, he does not believe that it is destined to come into extensive practical use because, first, its technic is complicated; second, the results fail to correspond with the clinical findings in 5 or 10 per cent. of the cases, and third, it is valuable only in normal pregnancy. In speaking of pituitary extract, he says that his experience has shown that the judicious administration of the drug will do away with the necessity for the application of low forceps in from one third to one half of the cases in which this method was formerly employed; but he urges that great care should be exercised in the use of pituitary extract, as its injudicious employment may place the life of both mother and child in jeopardy. Furthermore, the claims made by several manufacturers concerning its harmlessness are inaccurate and extremely reprehensible, as they are calculated to lead inexperienced practitioners into therapeutic excess to the detriment of their patients. He believes that eventually the use of pituitary extract will be limited to the latter part of the second stage, and this only as a competitor with low forceps. The present revision will maintain the high standard of this work as a practical up-to-date guide to the obstetrician. Many new illustrations have been added. The bibliography given at the end of each chapter is valuable; it bears all the earmarks of having been verified.

PAIN AND PLEASURE. By Henry Thomas Moore, Ph.D., Assistant Professor of Psychology, Dartmouth College. Cloth. Price, $1.25 net. Pp. 174, with 11 illustrations. New York: Moffat, Yard & Co., 1917.

The author states that pain may be described as of three fairly distinct types—surface pain, distinguished by sharp clearness, exactness of location and well coordinated reaction; bodily distress, characterized by obscure dulness, difficulty of exact location, and a general and somewhat aimless bodily reaction; and unpleasantness, marked by such obscurity that it is commonly spoken of as feeling. It has no particular location, but seems to pervade the whole body. Pleasure may be derived from stimulation of the surface of the body; gratification is the pleasure derived from satisfying the needs of the inner organs, a form of which is distinctly experienced for each of the body needs; then there is pleasantness, which is least capable of exact location or definition. Pain and pleasure as sensations have probably been evolved gradually out of a primitive obscure state of well-being, or pleasantness, and malaise, or unpleasantness. All three varieties of pain and pleasure described can be best accounted for by reference to the fact that every living organism is born with the capacity for struggle, and in an environment in which struggle is a fundamental law of nature. Pain signifies either that the environment has demanded too much of the organism's limited capacities, or that it has failed to offer a point of contact for unused activity. Pleasure signifies either that the environment has furnished occasion for a conflict to which the organism's powers are equal, or that opportunity is being afforded for recovery from a struggle carried to an extreme point—the pleasure of rest, for instance. As to the diagnostic value of pain, it is said that pain is the physician's most reliable dependence as a means of diagnosis, but it is necessary to have perpetually in mind the possibility that a given pain may be "imaginary" (psychasthenic or neurasthenic) or "referred" (giving a false indication as to the real source of the trouble). The former source of error can, in a measure, be guarded against by tests of suggestibility, by noting the change of facial expression, of blood pressure and of the pupil reflex. The author concludes what is an interesting psychologic study of pleasure and pain by saying, "Whether as sensation or as feeling, the broad significance of pain and pleasure is to be found in the fact that life is essentially a struggle, in which pleasure is the accompaniment of some form of mental or physical success, and pain is an indication of defeat or of abortive effort."

HEALTH SURVEY OF NEW HAVEN. A Report Presented to the Civic Federation of New Haven by Charles Edward Amory Winslow, James Cowan Greenway and David Greenburg of Yale University. Paper. Price, 75 cents. Pp. 114, with 30 illustrations. New Haven: Yale University Press, 1917.

This book deals with public health conditions in New Haven, and recommendations for their improvement. The report is unusually free from destructive criticism. Under each heading, conditions existing at the time of the investigation are given, followed by an analysis and specific recommendations for improvement. Forty-five such recommendations are made on the basis of the author's findings, following approved methods of public health administration but adapted to New Haven's needs. Such a report made by trained men should be of value to other cities as a guide in efficient organization and modern methods of public health administration. The authors have pointed out that New Haven is getting good service for the money expended, but that this amount needs to be increased from 30 cents per capita to 50 cents to secure the best results.

PSYCHOLOGICAL TESTS. A BIBLIOGRAPHY. Compiled by Helen Boardman, Research Worker for the Bureau of Educational Experiments. Paper. Price, 25 cents. Pp. 75. New York: Bureau of Educational Experiments, 1917.

While this is not an exhaustive bibliography, it is a very useful one; for the articles on this subject are numerous, and widely scattered through medical, psychologic and pedagogic journals. Each entry is followed by a brief annotation giving the scope of the article. The bibliography would present a much better appearance if the references were uniform in style. The volume number is given sometimes in Arabic and sometimes in Roman, and the date of the publication in some places precedes the volume and page and again follows it.

THE TREATMENT OF EMERGENCIES. By Hubley R. Owen, M.D., Surgeon to the Philadelphia General Hospital. Cloth. Price, $2 net. Pp. 350, with 249 illustrations. Philadelphia: W. B. Saunders Company, 1917.

This book is essentially an enlargement of the author's lectures to policemen, firemen and nurses, and as such it is a commendable addition to first aid work, especially for all those, whether professional or lay, who wish to make a more comprehensive study of the subject. The author has aimed, in each instance, to give the underlying principle of each dressing and the reason for a particular method of application. The language used is plain and clearly descriptive, and no exception can be taken to the treatment of the subject or the correctness of the teachings.

Social Medicine, Medical Economics and Miscellany

Welfare of Mothers and Children in Ireland

The birth rate in Ireland has been diminishing for the past ten years; in 1915 there were 3,000 fewer births than in 1914, perhaps partly the result of conditions connected with the war. The deaths of children under 1 year for 1915 were 92 per thousand. In England during the same year the number was 110 per thousand, and in Scotland 126. While the figures for Ireland seem, therefore, to be better than those for England and Scotland, the comfort to be derived from them is diminished by the knowledge that in England and Scotland there has been a steady, rather rapid decline in the deaths under 1 year, whereas in Ireland the rate has remained almost stationary for many years.

These facts, together with many others regarding the welfare of mothers and children in Ireland, are set forth in the report of the Carnegie United Kingdom Trust on Ireland (1917) written by Dr. E. Coey Bigger, medical commissioner of the Local Government Board for Ireland. While the decline in the death rate in England among infants under 1 year has been 24 per cent., in Ireland it has not amounted to over 8 per cent., the actual figures for this age being for Ireland, 1891-1900, 104; 1901-1910, 96, and 1911-1915, 91, and for those from 1 to 4 years of age, 88.7, 58.9 and 52.5, respectively. The chief causes assigned are low wages and the low standard of living or downright poverty of a large proportion of the population; bad housing in city and country; increase in the urbanization of the population, with higher consequent death rate, and decline in breast nursing on account of the lowered vitality of mothers due to improper nourishment, the defective condition and deficiency of the milk supply, which is general throughout Ireland, the lack of knowledge of mothercraft, etc.

The greater death rate among infants of the laboring classes, the low wage earners, is marked and distinct, and its relation to the quantity and quality of the diet of the people is indicated in the following:

> For the past twenty years the available income of both laborers and farmers has risen, but the cost of food has, at the same time, risen and its nature has changed. Milk porridge and potatoes were once the staple food of the laboring and farming class; now it is bread and tea and potatoes—a change very much for the worse, and one which is bound to react on the infant by making the mother less fit to bear her child, and to suckle it when born.

The report shows that some progress is being made in improving the housing conditions, in better hospitalization, better reporting, better nursing and enlightenment with regard to artificial feeding, and in general welfare work by various organizations.

Report of New York Committee on Feeblemindedness

The New York Committee on Feeblemindedness, which was organized in March, 1916, under the chairmanship of R. Bayard Cutting, is carrying on a campaign in New York State to secure adequate provision for the care, supervision and training of the feebleminded and epileptic. The aims of the committee, as set forth in its first annual report, are to improve the usefulness of the state institutions for the benefit of the feebleminded, to further the establishment of special classes in the public schools, and to aid in the establishment of a system of guardianship and supervision in the home. Preventive measures, of course, are prominent in the committee's aims. To attain these objects, the committee is working along the following lines: the gathering and dissemination of information concerning the feebleminded; organization and leadership of individual effort and social agencies, and promotion of legislation.

A conservative estimate gives the number of feebleminded persons in New York State as 35,000, of whom 6,000 are provided for in proper institutions; 4,500 are detained in almshouses and jails without appropriate care, and over 24,000 are unprotected in the community, are the bearers of disease, and live in a state of poverty and degradation. It is shown that from 20 to 30 per cent. of the inmates of correctional institutions are mentally defective, and studies of habitual offenders show that nearly one half of all crime can be laid at the door of feeblemindedness. It has been estimated that 2 per cent. of the children in the public schools are retarded to such a degree as to constitute feeblemindedness. One of the great causes of feeblemindedness is heredity, and the birth rate among the mental defectives is found to be approximately twice that of the normal population. Prevention of marriage of feebleminded persons would reduce immediately the proportion of the feebleminded, paupers, criminals and no-account persons. It is said that the only means of accomplishing this which is agreeable to the sensibilities of the average citizen is segregation and institutional care. It is along these lines that the committee has been directing its efforts.

Medicolegal

Insufficient Information Under Statute Defining Practice of Medicine

(*People vs. Watson* (*Mich.*), *162 N. W. R. 943*)

The Supreme Court of Michigan holds that the verdict should be set aside, and the defendant discharged in a case in which his conviction was under an information that alleged that he "unlawfully did engage in the business of practice of medicine, and did practice medicine, within the meaning of Act 237 of the Public Acts of the state of Michigan for the year 1899, and the amendments thereto, without before so doing having complied with the provisions of said act" and its amendments, etc. The court says that the information was bad because (1) the general words employed therein do not fully set forth all of the assignments necessary to constitute the offense; (2) the subject-matter of the offense is now defined by the statute by descriptive words, none of which are employed in the information; (3) a person may innocently do things embraced within the definition given in the statute.

Act 237, Public Acts of 1899, was amended by Act 368, Public Acts of 1913, so as to define the practice of medicine. Under former legislation it had been left to the courts to define—piecemeal, it is true, but nevertheless to define—what was the practice of medicine, by determining whether the proved acts of the person accused of violating the statute amounted to practicing medicine. The legislature undertook to make an exclusive and inclusive definition by enacting: "In this act, unless otherwise provided, the term 'practice of medicine' shall mean the actual diagnosing, curing or relieving in any degree, or professing or attempting to diagnose, treat, cure or relieve any human disease, ailment, defect or complaint, whether of physical or mental origin, by attendance or by advice, or by prescribing or furnishing any drug, medicine, appliance, manipulation or method, or by any therapeutic agent whatsoever." Here are the elements of the statute offense, a catalogue of the acts constituting "practice of medicine," the doing of which makes the actor liable to the statute penalty. Under such an act, to charge one generally with "practicing medicine" is not to charge him sufficiently with a wrongful act. Moreover, the foregoing statute definition is itself limited by the title of the act and the measure of the police power of the state. Some things within this statute category may be innocently done.

It will at once be perceived that the information before the court may or may not charge the defendant with committing an offense, in view of the definition of "practice of medicine" found in the act and the proper scope of the act, as evidenced and limited by its title; because, since the act has been sustained as valid on certain limitations of the definition, it is no longer sufficient to charge one with engaging in the business of practicing and with practicing medicine, contrary to the provision of the statute—the law having been held valid only when applied to such acts enumerated therein as

"in common acceptation and as generally construed by the courts" are regarded as engaging in the "practice of medicine." The rule that in indictments and informations for offenses created by statute it is sufficient to describe the offense in the words of the statute, and that when the words of the statute are descriptive of the offense it is safe to follow the language there used, is a rule that was not observed by the pleader, since the descriptive words found in the present statute are not used in the information. Moreover, so long as a person may innocently do some things embraced within the definition given in this particular statute, there is additional reason for particularity of statement of the acts committed in order to apprise the accused of the charge sought to be brought against him.

Combining Faith with "Patent Medicines"

(People vs. Vogelgesang (N. Y.), 116 N. E. R. 977)

The Court of Appeals of New York, in affirming a judgment of conviction of the defendant of having illegally practiced medicine, says he claimed he was a spiritualist and had practiced the religious tenets of his church. If that was all he did, he acted within his rights. The court, however, thinks he did more. In February, 1915, one Haldeman, then suffering from heart disease, visited the defendant's office. He paid four visits there, and received three visits at his own home. He died the next month. The defendant rubbed his body with a liniment, and gave him medicine for internal use. All this was done for pay. The patient's wife accompanied him to the office. She said the defendant never uttered a word about spiritualism. The defendant handed to his patient a pamphlet, the title on the cover of which gave the defendant's name, and added the words: "Specialist in all forms of chronic diseases; strictly confidential; consultation free." Within the covers was a sketch of the defendant's life. It told that, when 11 years old, "he would get herbs and give them to sick people, for he seemed to know what would be good for them." In later years the Erie County Medical Society complained of him, and a fine was imposed. "After that," said the sketch, "he joined the New York State Association of Spiritualists." The sketch was followed by many testimonials from patients. All, or nearly all, acclaimed the virtue of his medicines. Not one of them betrayed a consciousness that the supposed cure had been wrought through the power of religion. This was the pamphlet by which the defendant accredited himself to Haldeman. One cannot find here the picture of the religious devotee. One can find only the picture of the unlicensed medical practitioner. The picture was not changed by the defendant's testimony. On the stand he characterized himself as a therapeutic and spiritualist healer and dealer in "patent medicines." He had patented them himself. He used a liniment, compounded of angleworms, turpentine, sweet oil and benzin. He said that, while massaging the patient with this liniment, he indulged in silent prayer. He also prescribed for internal use a medicine compounded of wine, beef tea and citrate of iron. The same medicine was used for every one. He argued that all this must be excused, because he had become a member of the spiritualist church, and had been commissioned by that church as a spiritual healer.

The New York statute prohibits the practice of medicine without a license, but excepts from its prohibition "the practice of the religious tenets of any church." This court held in *People* v. *Cole*, 219 N. Y. 98, 113 N. E. 790, that the exception protected the practitioners of Christian Science, who taught as part of their religion the healing power of mind. Even then the court said there were times when the question of their good faith must be submitted to a jury. But things were done by this defendant which no good faith could justify. He combined faith with "patent medicine." If he invoked the power of spirit, he did not forget to prescribe his drugs. "It is beyond all question or dispute," said Voltaire, "that magic words and ceremonies are quite capable of most effectually destroying a whole flock of sheep, if the words be accompanied by a sufficient quantity of arsenic." The law, in its protection of believers, has other cures in mind. The tenets to which it accords freedom, alike of practice and of profession, are not merely the tenets, but the religious tenets, of a church. The profession and the practice of the religion must be itself the cure. The sufferer's mind must be brought into submission to the infinite mind, and in this must be the healing. The operation of the power of spirit must be, not indirect and remote, but direct and immediate. If that were not so, a body of men who claimed divine inspiration might prescribe drugs and perform surgical operations under cover of the law. The law exacts no license for ministration by prayer or by the power of religion. But one who heals by other agencies must have the training of the expert.

Liability for Sponge and Silk Thread in Wound—Evidence

(Wynne et ux. vs. Harvey et al. (Wash.), 165 Pac. R. 67)

The Supreme Court of Washington says that in this action against the physicians and a nurse for alleged malpractice in connection with an operation on Mrs. Wynne for an enlarged uterus, after a trial of the case on the merits, a motion for nonsuit was granted as to the nurse, but a verdict for $5,000 was entered against the physicians. Now the action is ordered dismissed as to the assistant physician or surgeon, with costs to him, while the judgment is affirmed as to the physician or surgeon in chief.

The operation did not seem to be very successful, as the wound refused to heal and a fistula was formed, which discharged impure matter, including a silk thread. Afterward, through another operation, a small mop sponge was found, next to the inside of the abdominal wall. Defendant Harvey had been treating the plaintiff for some time prior to the first operation, but on account of the seriousness of the operation it was decided he should have an assistant, and the other physician was employed in that capacity, by Mr. Wynne. In cases of this character, the rule concerning the liability of two physicians independently engaged has been well stated to be that each, in serving with the other, is rightly held answerable for his own conduct, and as well for all the wrongful acts or omissions of the other, which in the exercise of reasonable diligence under the circumstances he should have observed. The evidence showed that this assistant had nothing to do with the sponges or mopping with them on the inside of the incision. It is obvious that he would not be liable for this negligence because of any wrongful act of his own. His activities were confined mainly to the outside of the wound, and, since the duties of an assistant are to do as directed by the chief operator, and there was no showing either that he was directed to keep track of the sponges or that it was made his duty by custom to do so, it is apparent that, in the exercise of reasonable diligence under the circumstances, no duty devolved on him to discover that the sponge was not removed, the omission of which would render him liable to an action for damages.

In considering the appeal of defendant Harvey, the court found that the complaint alleged negligence in the use of silk thread, instead of catgut, in tying off the arteries, and the only evidence to sustain this allegation was that a piece of silk thread was discharged through the fistula that formed in the plaintiff's body. Impliedly admitting that it was improper to use silk in tying off arteries, and to explain its presence, defendant Harvey claimed that it was used in suturing a ruptured intestine, and produced evidence to show that in so doing silk was the proper and better material to use. But while there was no direct evidence to show that silk was negligently used in tying off arteries, there was evidence to show that silk was negligently used, as the thread discharged through the fistula was No. 12, which, according to the testimony of the experts, was far too large for use in suturing a ruptured intestine, the majority of the experts being of the opinion that in no event should silk thread of larger size than No. 3 or No. 4 be used for this purpose. Precisely what use was made of the silk thread, and where, was manifestly unknown to the plaintiff, save by results. The exact place and manner were known to defendant Harvey, who used it, and he was chargeable with reasonable care, skill and knowledge in its use. The court does

not consider this evidence a material variance from the allegations of the complaint, and there was, therefore, sufficient evidence to submit this issue to the jury's consideration.

There being no evidence in the record that the sponges were counted by the attending nurses, or that defendant Harvey knew there was another sponge in the incision, the facts in this case did not bring it within the asserted exception that it is not negligence for a surgeon to leave a foreign substance in a wound when in his professional judgment further exploration for such foreign substance would endanger the safety of the patient.

The plaintiff could testify to such commonplace conditions and effects as that dressings were sometimes changed by defendant Harvey and sometimes by a nurse; that sometimes he would not come when requested; that sometimes dressings were not changed and pus would dry on them, and that the drainage tubes were not sterilized every time the dressings were changed.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Minneapolis, Dec. 27-29.
American Physiological Society, Minneapolis, Dec. 27-29.
Porto Rico Medical Association, San Juan, Dec. 22-23.
Society of American Bacteriologists, Washington, D. C., Dec. 27-29.
Western Surgical Association, Omaha, Dec. 14-15.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION

Annual meeting, held at Toledo, Ohio, Oct. 9-11, 1917

The President, DR. CHANNING W. BARRETT, Chicago, in the Chair

What Reliance Can Be Placed in Our Laboratory Findings in Central Nerve Syphilis?

DR. ALBERT E. STERNE, Indianapolis: A positive Wassermann test of the blood, and especially of the spinal fluid, spells syphilis and syphilis only; but a negative serum Wassermann, and even a negative spinal fluid Wassermann, does not strictly indicate the absence of syphilis. Laboratory tests are merely clinical signs, which at times may be present or absent, like other symptoms; spinal fluid tests should always be made with blood serum tests, and their correct interpretation can be made only by weighing carefully the clinical evidence, with the serologic report, especially when the latter are negative. The laboratory findings should fit into the clinical syndrome, and not vice versa.

Intensive Combined Treatment of Syphilis

DR. J. H. STOKES, Rochester, Minn.: We have come to regard the effect of mercury on the kidney as the weak point in radical methods in the management of syphilis. This applies with special force to the intramuscular injection, and especially to the injection of insoluble mercurial salt, the convenience of which may easily be counterbalanced by much damage that goes undetected because of the irksomeness, to the majority of physicians, of the frequent, careful urinalysis. Radical treatment is indispensable; therefore, means to protect the kidney, especially, from its very real dangers should be devised.

Some Recent Developments in Intraspinal Therapy

DR. OSCAR BERGHAUSEN, St. Louis: In the treatment of epidemic meningitis, no one who has followed the results carefully will dispute the advantages to be gained by the withdrawal of the spinal fluid and subsequent introduction of the specific serum in these patients. The mortality is now, roughly speaking, about 50 per cent. in public institutions, whereas formerly it was 75 per cent. The combined intravenous and intraspinal injection of antitetanic serum has the advantage of sending the serum to all parts of the body. The former enormous doses are not necessary. Much smaller amounts will suffice, if the serum is used both intraspinally and intravenously. In the treatment of syphilis of the central nervous system, simple drainage of the subarachnoid space, or drainage plus the introduction of a normal serum, or a serum to which minimal amounts of salvarsan have been added, not to exceed from 0.1 to 0.5 mg., is a safe and sound procedure.

DISCUSSION

DR. HUGH T. PATRICK, Chicago: It is important that our serologic examinations should be made by men who are laboratory experts. We should not consider any evidence, however negative it may be, as evidence of cure. Any patient with syphilis who has been cured temporarily and has apparently become entirely well should be subjected to reexamination, not the ordinary clinical examination, but examination of the blood and also of the spinal fluid every six months for a considerable time.

DR. R. B. H. GRADWOHL, St. Louis: The whole question of the Wassermann reaction in the treatment of syphilis is a complicated one. While it is a very useful test as a diagnostic measure, as a prognostic measure, as a guide for treatment, we cannot always make deductions mathematically from it.

DR. F. B. WYNN, Indianapolis: The inunction treatment is the most effective form of mercurial treatment, although the injection treatment is the most popular.

Goiter from the Standpoint of the Pathologist

DR. LOUIS B. WILSON, Rochester, Minn.: Most of the malignant tumors of the thyroid have their origin in nodular adenomas which are usually passed over as benign. When we consider that the metastases from such cases are frequently in the lungs, and that both from the clinical and the gross anatomic standpoint they are difficult to distinguish from miliary tuberculosis of the lungs, I am convinced that many of them are diagnosed as the latter affection when in reality they are due to malignant neoplasms primary in the thyroid. Unless a necropsy is performed in such cases, the clinical diagnosis is of little value.

Goiter from the Standpoint of the General Practitioner

DR. GRANVILLE N. RYAN, Des Moines, Iowa: One must keep in mind constantly the individuality and personal equation of each patient. A complete and painstaking history is most essential. The parenchymatous varieties that occur in the young are the most amenable to medical treatment, if not of too long standing. If degeneration has occurred in a case of long standing, the case is a medical one until the damage is repaired and the patient is surgically fit. In hyperthyroidism, the end result desired can be attained only by team work.

Goiter from the Standpoint of the Laryngologist

DR. JOSEPH C. BECK, Chicago: The thyroid, so far as the laryngologist is concerned, is considered only when it produces pressure, causing either paresis or paralysis of the muscles supplied by the recurrent laryngeal nerve, or tracheal compression. Another aspect to be considered in cases of chronic infection of the upper respiratory tract producing a thyroid gland change is that of the toxemias acting on the autonomic nervous system, which changes the harmonic action of the various glands of internal secretion so as to produce thyroid disease. The advanced laryngologist, the laryngologist who has had a thorough training in general surgical principles, should encroach on this phase of surgery, especially when there are symptoms referable to the larynx and trachea.

The Heart in Goiter

DR. ROBERT H. BABCOCK, Chicago: The treatment of mechanical derangements is surgical. In the toxic form, the treatment must also be directed to the thyroid rather than to the heart, except in certain cases in which treatment of the heart condition is understood. Our usual medicaments, such as digitalis, exert very little effect on the goiter heart, sometimes actually increasing the discomfort from palpitation. Rest, mental and physical rest, in proper environment, and careful diet are, perhaps, the best measures to allay the unpleasant sensation of palpitation. I have found that in some cases tincture of aconite, in doses of from 20 to 30

minims, three or four times a day, considerably lessens the patient's sense of discomfort. On the whole, however, except so far as we may obtain some relief from the use of serum or preparations from thyroidectomized goats, the treatment is surgical.

Surgery of Exophthalmic Goiter

DR. HARRY G. SLOAN, Cleveland: Once the diagnosis of exophthalmic goiter is made, we advise operation. We put the patients to bed so that they may have absolute physical rest; we overfeed them, keep them in the fresh air as much as possible, and see that proper elimination from bowels and kidneys is obtained. The patient is given 10 grains of thyroid extract the evening before operation, and after operation 5 grains, every two hours, for the first day and a half. The body tissues have been depending on the secretion of the thyroid for some substance that aids in the oxidation of the waste product, and the sudden removal of the thyroid handicaps the organism until compensation takes place. Hence the substitution of thyroid extract. The immediate after-results vary with the severity of the disease and the length of time it has existed. All patients who recover after thyroidectomy are improved or permanently cured.

Nonsyphilitic Aortitis

DR. WILLARD C. STONER, Cleveland: It is accepted that acute infections, such as influenza and pneumonia, play no small part in producing aortitis. The intoxicants, such as alcohol, lead and tobacco, play some part, but no doubt alcohol is overestimated as a cause. Overeating as a cause of vascular hypertension and vascular disease cannot be overestimated. Anything that tends to overactivity of the suprarenals tends to vascular disease. Chronic foci of infection, such as bad teeth or tonsils, may be responsible for arterial change. Rheumatic fever may cause aortitis in association with valvular disease, and aortic changes are reported frequently as a result of typhoid. The question arises, What can be done for these patients? We cannot give them new aortas, but we can give them comfort. Absolute rest in bed for a period of time has a distinct value in the lowering of tension. All worry and strenuousness in life should be avoided. Encouragement of elimination and low protein diet should be advised, and if the patient is obese, weight should be reduced. Medicinally, iodids and nitrites are indicated. If the process is acute, direct therapy should be instituted for the general condition, bearing in mind that these patients are to be managed rather than treated.

The Value of the Complement Fixation Test in the Diagnosis of Incipient Tuberculosis

DR. R. B. H. GRADWOHL, St. Louis: The complement fixation test is absolutely specific for tuberculosis. It is not always present in all cases, and it seems to disappear when the process subsides. This test will be found a valuable addition to the diagnostic aids of the clinician. We have very few data on which to base a conclusion that negative reactions mean arrest of tuberculous processes. The observation of the patient over long periods of time must still remain the proper method of adjudicating this question.

Cancer Research in Switzerland.—The Swiss Cancer Research Association is appealing to the physicians of Switzerland to fill out a question blank which is being distributed to obtain data on mammary cancer. The appeal states that Switzerland is one of the countries where cancer is most prevalent, and cancer of the breast in particular seems to be on the increase. Physicians are asked to supply the data in regard to all the cases of mammary cancer encountered in the five years ending with 1915, cured or still under treatment at this date. For each response a fee of 40 cents is paid. Each physician who made out a death certificate during those years in a case of mammary cancer will be sent a question blank. The points to be specially noted are the influence of lactation, of preceding inflammatory affections or benign tumors, the influence of operative treatment on the prognosis in general and on metastasis in particular, and the actual value of roentgen and radioactive treatment.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

October, LXXIV, No. 2

1 Development of Personality. E. G. Conklin, Princeton, N. J.—p. 123.
2 Wider Field of Activity for Association. J. V. May, North Grafton, Mass.—p. 129.
3 Ought Limited Responsibility to be Recognized by Courts? C. P. Bancroft, Concord, N. H.—p. 139.
4 Need of Closer Relationship Between Psychiatry and Medical Schools. A. H. Ruggles, Providence, R. I.—p. 149.
5 Psychiatric Problems at Large. A. J. Rosanoff, Kings Park, N. Y.—p. 157.
6 Aims and Meaning of Psychiatric Diagnosis. A. Meyer, Baltimore.—p. 163.
7 Study of Self Accusation. E. D. Bond, Philadelphia.—p. 169.
8 Certain Clinical Aspects of Late Katatonia; Report of Cases. E. A. Strecker, Philadelphia.—p. 185.

American Journal of Syphilis, St. Louis

October, I, No. 4

9 *Syphilis of Pulmonary Artery: Aneurysm of Left Upper Division; Spirochaeta Pallida in Wall of Artery and Aneurysmal Sac. A. S. Warthin, Ann Arbor, Mich.—p. 693.
10 *Latent or Clinically Inactive Syphilis in Canal Zone. G. L. Quilt, Ancon, C. Z.—p. 712.
11 Comparison of Some of Important Phenomena in Syphilis and Tuberculosis. F. M. Pottenger, Monrovia, Calif.—p. 718.
12 Behavior of Lymphatic System in Syphilis. D. W. Montgomery, San Francisco.—p. 729.
13 Syphilis of Liver. H. L. McNeil, Galveston, Texas.—p. 738.
14 *Causes of Arterial Hypertension, with Special Reference to Syphilis—Clinical Inquiry. J. S. McLester, Birmingham, Ala.—p. 746.
15 Syphilis as Cause of Chronic Urticaria. H. H. Hazen, Washington, D. C.—p. 750.
16 Advisability of Prostatectomy in Presence of Cord Lesion: Report of Cases. E. S. Judd and W. F. Braasch, Rochester, Minn.—p. 752.
17 *Roentgen Diagnosis of Lung Syphilis. W. W. Watkins, Phoenix, Ariz.—p. 760.
18 Proposed Standardization of Wassermann Reaction. A. W. Stillians, Chicago.—p. 767.
19 *Wassermann Reaction in Four Hundred Cases Investigated by Group Study Methods. E. V. Knapp, San Francisco.—p. 772.
20 *Modified Wassermann Technic Based on Rapid Fixation of Complement Present in Human Serum. C. J. Bartlett and A. J. O'Shansky, New Haven, Conn.—p. 776.
21 Few Points on Public Prophylaxis against Syphilis. A. Ravogli, Cincinnati.—p. 788.
22 Technic of Complement Fixation Test for Syphilis. C. F. Craig, Leavenworth, Kan.—p. 802.

9. **Syphilis of Pulmonary Artery.**—Up to the present no positive pathologic evidence of the existence of a syphilitic atherosclerosis of the pulmonary artery has been produced. Warthin's case offers such positive evidence; and syphilis of the pulmonary artery is now put on the same basis as that of the aorta. The microscopic changes in the atherosclerotic pulmonary artery of this case show exactly similar changes to those found in the wall of definitely recognized syphilitic aortas. Given sections of this pulmonary vessel cannot be distinguished microscopically from given sections of syphilitic aortas. The evidence here speaks decidedly in favor of the view of the specific nature of this especial form of arterial change. From Warthin's experience he believes that atherosclerosis, either of the ordinary type or of the syphilitic type macroscopically, that shows on microscopic examination perivascular infiltrations of lymphocytes and plasma cells along the course of the vasa vasorum, most marked in the adventitia; and following the vessels in their course through the media toward the intima, with obliteration of the arterioles, new formation of capillaries, fibroblastic proliferation, fibrosis of intima and media, secondary hyaline change and atheroma, is specific in character, and is due to the localization of the *Spirochaeta pallida* along the vasa vasorum.

Macroscopically the picture presented by the affected artery may be that of ordinary atherosclerosis or of the type recognized at the present time as syphilitic mesaortitis. Syphilis cannot be ruled out by the naked eye appearances of the aorta or artery at the necropsy table; the necropsy diagnosis of syphilis, however, can be made on the macroscopic criteria of syphilitic mesaortitis, as given above. Aortas presenting

the gross picture of atherosclerosis may show on microscopic examination the most marked syphilitic infiltrations of the media and adventitia, and in Levaditi blocks from the same the presence of spirochetes has been shown. The microscopic examination is the only method by which syphilis of a vessel can be determined; macroscopic appearances cannot be relied on. The gross appearances of the pulmonary artery in this case were those of atherosclerosis. Had it not been for the aneurysm present its syphilitic nature would not have been sought and demonstrated.

10. **Latent Syphilis in Canal Zone.**—From a total of 1,198 colored surgical patients seen by Qualls, 908 showed no evidence of syphilis or gave history suggestive of the disease; 297 showed active evidence of syphilis or gave histories indicating previous syphilitic infection. The Wassermann test survey shows 23.7 per cent. of the nonsuspects to be syphilitic, and 36.7 per cent. of the suspects to be syphilitic. A grand total syphilitic infection of 27 per cent. exists among all colored employees admitted to the surgical wards. The latent syphilitic infection among colored male employees in the Canal Zone is exceedingly high; 23.7 per cent., as compared with the white employees showing 2.3 per cent. The total syphilitic infection among the white surgical patients is 15 per cent.

14. **Causes of Arterial Hypertension.**—Of 678 patients seen by McLester 124 had arterial hypertension varying from 155 mm. to 200 mm. and over. The average age of these patients was 53.75 years. Thirty-three patients gave a history of typhoid, 14 of pneumonia, 3 of yellow fever and 3 of recent scarlet fever. Only 6 patients admitted the excessive use of alcohol. The heart was enlarged in 67 instances, about 50 per cent. Albumin alone was found in the urine in 29 instances, and both albumin and casts in 61, or 50 per cent. of the cases. It is unfortunate that the phenolsulphonephthalein test of kidney function was made in only 11 of these, the average excretion in two hours being 49 per cent. The urine of 10 patients, 8 per cent. of the whole group, contained sugar. Among the focal infections were noted: 4 instances of diseased tonsils, 4 of infection of the accessory nasal cavities, 42 of diseased teeth (35 per cent.), 4 of chronic appendicitis, and 5 each of gallbladder and urinary tract infections. Twenty-one patients, or 17.5 per cent., gave a positive Wassermann reaction. Of the entire series of 678 patients 16.5 per cent. gave a positive Wassermann reaction.

17. **Roentgen Diagnosis of Lung Syphilis.**—Observations made by Watkins on approximately 1,000 chest roentgenograms justify the assertion that not fewer than 15 per cent. of tuberculous patients have also a syphilitic infection.

19. **Wassermann Reaction in Four Hundred Cases.**—The 400 cases studied by Knapp showed that men are five times more frequently syphilitic than women; that the central nervous system leaves demonstrable traces of the disease in 50 per cent. of the cases; that most of the cerebrospinal syphilis cases are in the male division; that the most important single method of examination for syphilis is the physical examination, the Wassermann second and the history least. The most convincing clinical diagnosis is when physical examination, Wassermann and history are all positive, the next in importance where two are positive and one negative, and the least where but one gives positive evidence.

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23 Physician's Impressions of Florida. W. L. Johnson, Uxbridge.—p. 647.
24 Tuberculosis in Dairy Cattle. C. M. Hilliard, Boston.—p. 654.
25 Danger to Children from Tuberculosis in Cattle. R. M. Smith, Boston.—p. 657.
26 Starting Health Habits in Childhood. L. P. Loring, Prides Crossing.—p. 659.
27 Community Health and Tuberculosis Demonstration at Framingham. D. B. Armstrong, Framingham.—p. 660.
28 County Tuberculosis Hospitals; Report of Progress. E. R. Kelley, Boston.—p. 663.
29 What Becomes of Discharged Consumptives? B. M. Billings, Boston.—p. 664.
30 Annual Report of Massachusetts Antituberculosis League, 1917. S. H. Stone, Boston.—p. 667.

Journal of Experimental Medicine, Baltimore

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31 *Relation of Spinal Cord to Spontaneous Liberation of Epinephrin from Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 613.
32 *Effect of Stimulation of Sensory Nerves on Rate of Liberation of Epinephrin from Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 637.
33 Bactericidal Fluorescence Excited by Roentgen Rays. H. S. Newcomer, Philadelphia.—p. 657.
34 Hemolysins of Vegetable Origin. I. L. Kritchevsky, Moscow, Russia.—p. 669.
35 *Development of Toxicity in Intestinal Secretion. D. M. Davis and H. B. Stone, Baltimore.—p. 687.
36 Comparative Study of Serum and Lymph Ferments After Feeding. B. F. Davis and W. F. Petersen, Chicago.—p. 693.
37 Comparative Study of Lymph and Serum Ferments During Protein Shock Reactions. B. F. Davis and W. F. Petersen, Chicago.—p. 699.
38 *Glomerulonephritis. An Attempt to Produce Glomerulonephritis by Repeated Injections of Bacteria. H. E. Faber and V. Murray, San Francisco.—p. 707.
39 *Interrelation of Surviving Heart and Pancreas of Dog in Sugar Metabolism. A. H. Clark, Baltimore.—p. 721.
40 *Carriage of Virus of Poliomyelitis with Subsequent Development of Infection. E. Taylor and H. L. Amoss, Burlington, Vt.—p. 745.

31. **Relation of Spinal Cord to Spontaneous Liberation of Epinephrin.**—After section of the spinal cord in cats in the cervical region, as low as the last cervical segment, epinephrin continues to be liberated from the suprarenal glands. This liberation has all the characters of the normal secretion with intact central nervous system. It is sustained through the same nerve paths connecting the cord with the suprarenals. After section of the cord in the middorsal region the spontaneous liberation of epinephrin from the suprarenals is abolished within the limits of detectability by the methods employed (denervated eye reactions of Meltzer, and rabbit intestine and uterus segments). The portion of the cord concerned in the liberation of epinephrin does not appear to extend much below the third thoracic segment. In acute experiments on cats under urethan anesthesia no change in the rate of liberation of epinephrin which could be detected by the tests employed, was observed when the cord was severed in the cervical region.

32. **Effect of Stimulation on Rate of Liberation of Epinephrin.**—An attempt was made to determine whether stimulation of afferent nerves (sciatic and brachial) produced a detectable increase in the rate of liberation of epinephrin from the suprarenals, as determined by testing suprarenal vein blood on rabbit intestine and uterus segments. The result was negative.

35. **Toxicity of Intestinal Secretion.**—Davis and Stone assert that intestinal secretion collected by the method described in this paper is nontoxic when fresh. This secretion, when heated immediately to 90 to 95 C. and kept sterile, remains nontoxic. This secretion when not heated remains nontoxic when kept under chloroform and toluene, even if incubated at 37 C. This secretion when not heated, but collected in a sterile flask, becomes toxic on incubating eighteen hours, producing symptoms like those of closed loop fluid. The secretion, when treated with chloroform and toluene, and later incubated for eighteen hours, after these preservatives have been removed by distillation at 60 C., does not produce lesions typical of closed loop fluid.

38. **Attempt to Produce Glomerulonephritis by Injections of Bacteria.**—Repeated injections into the blood stream of streptococci and staphylococci derived from cases of scarlet fever, and of *Bacillus coli-communior* failed to produce typical glomerulonephritis even when immune bodies could be demonstrated in the serum in high dilutions. Bacteriolysis of streptococci was not found by the usual tests in vitro or by the Pfeiffer procedure.

39. **Heart and Pancreas in Sugar Metabolism.**—When the pancreas of a dog is perfused aseptically with a Locke's solution containing dextrose in physiologic concentrations, the optical rotation of the perfusate is diminished, but its reducing power is unaltered. This change also occurs if dextrose is added to a sugar-free pancreatic perfusate and the mixture incubated. These perfusates yield osazones with lower melting points than glucosazone, but when the per-

fusates are hydrolyzed with weak acid their optical rotations and the melting points of their osazones are increased. These changes do not occur with levulose, or with an extract of the pancreas and dextrose. When the heart, spleen or kidneys are perfused with dextrose solutions, hydrolysis of the perfusates does not increase their optical rotation or power of reduction. When a pancreatic perfusate containing dextrose is circulated through a living heart, not only do the above changes take place but, in addition, the reducing properties of the perfusate are altered. Hydrolysis of such a perfusate increases its reducing power, its optical rotation, and the melting point of its osazone. A heart does not cause this effect either alone or when perfused together with the spleen or kidneys. Levulose perfused through the heart and pancreas is unchanged. These phenomena are believed to be due to an enzyme or enzymes obtained from the perfused pancreas. The changes in optical rotation, in reduction, and in the osazones are accounted for by different degrees of dextrose condensation. While the living heart can destroy both dextrose and levulose to some extent, the experimental results suggest that the enzyme or enzymes derived from the perfused pancreas have a specific action on dextrose and are responsible for certain essential steps by which dextrose is prepared for normal utilization.

40. **Carriage of Virus of Poliomyelitis.**—A family group containing four children of whom all showed in varying degree symptoms of poliomyelitis is described by Taylor and Amoss. The source of infection and periods of incubation have been followed. Two of the children were proved by inoculation tests to carry the virus of poliomyelitis in the nasopharynx. Of these, one was detected to be a carrier after recovering from a nonparalytic attack of the disease, and the other was discovered to be a carrier about five days before the initial symptoms, attended later by paralysis, appeared. The original case from which the three others took origin was fatal; the youngest child, after quite a severe onset, was treated with immune serum and made a prompt and almost perfect recovery. The nasopharyngeal secretions of two of the patients, taken one month after the attack, proved incapable of neutralizing an active poliomyelitis virus. The proposition is presented that every case of poliomyelitis develops from a carrier of the microbic cause, or virus, of poliomyelitis.

Journal of Immunology, Baltimore

October, II, No. 6

41 *Anaphylaxis in Dogs. The Liver in Shock and in Peptone Poisoning.—R. Weil, New York.—p. 525.
42 Tissue Transplantation and Anaphylaxis. L. Loeb, Washington, D. C.—p. 557.
43 Anaphylactic Reactions of Isolated Dog's Liver. R. Weil and C. Eggleston, New York.—p. 571.
44 New Method for Making Wassermann Antigens from Normal Heart Tissue. C. A. Neymann and L. T. Gager, Baltimore.—p. 573.

41. **Liver in Shock and Peptone Poisoning.**—Weil found that blood taken from dogs at the height of anaphylactic shock fails to produce any symptoms when injected, even in very large amounts, into normal animals, indicating that the blood does not contain any toxic substance. The isolated liver of a sensitized dog does not alter the coagulability of blood with which it is perfused; if, however, the antigenic substance is added to the blood before it traverses the organ, it passes out with its coagulability either diminished or completely abolished. The normal liver exercises no such effect. The injection of the antigenic substance, even in very small amount, into one branch of the portal vein of a sensitized dog produces an immediate severe congestion of the corresponding lobe of the liver. The blood rapidly becomes incoagulable, and symptoms of shock develop. Subsurface injection of the antigen into the sensitized liver produces a local focus of congestion. The postmortem examination of dogs dying in acute anaphylactic shock, within one hour, reveals as the single outstanding feature the enormous congestion of the liver. The other abdominal viscera show either very little congestion or none. The marked congestion of the gastro-intestinal tract in dogs dying after an interval of several hours is a late phenomenon, probably secondary to the congestion of the liver. Microscopic examination shows intense congestion of the liver, and degenerative changes in the parenchyma cells. Peptone affects the liver in exactly the same fashion as does anaphylaxis. The isolated organ, when perfused thereby, renders the blood incoagulable. Injection into one branch of the portal vein induces a localized area of hepatic congestion. The peptone theory of hepatic shock maintains that peptones are produced during the anaphylactic reaction, and that they are directly responsible for the symptoms. There are no experimental observations which establish this theory. It is based chiefly on the resemblances between peptone intoxication and anaphylactic shock, and these are adequately explained by the fact that in both conditions the same hepatic mechanism is affected. The peptone theory cannot be harmonized with the experimental data recorded in this paper. These results introduce a new function of the liver, namely, its participation in the immune reaction.

Journal of Laboratory and Clinical Medicine, St. Louis

October, III, No. 1

45 *Bearing of Antityphoid Vaccination on Diagnostic Value of Agglutination Test in Typhoid and Paratyphoid. E. Rist.—p. 1.
46 *Antibodies in Gonococcal Arthritis After Intravenous Injection of Specific and Nonspecific Protein. H. Culver, Chicago.—p. 11.
47 *Blood and Urine Ammonia in Acidosis. H. L. McNeil and M. D. Levy, Galveston, Texas.—p. 18.
48 *Infectious Meningitis. Study of Twenty-Seven Cases in Five Hundred and Eighty-Six Necropsies. S. Graves, Louisville, Ky.—p. 32.
49 *Prevention of Simple Goiter in Man. D. Marine and O. P. Kimball, Cleveland.—p. 40.
50 *Transplantation of Thymus in Rabbits—Relation of Thymus to Sexual Maturity. D. Marine and O. T. Manley, Cleveland.—p. 48.
51 *Complement Fixation Test in Tuberculosis with Besredka's Antigen. J. Bronfenbrenner, Boston.—p. 50.
52 Case of Congenital Cystic Kidney in which Tuberculous Process was Superimposed. P. G. Woolley, Cincinnati.—p. 55.
53 Effect of Natural Antisheep Hemolysin Content of Human Serum on Complement Fixation Tests. A. I. van Saun, Albany, N. Y.—p. 59.
54 *Wassermann Reaction with Large Amounts of Patient's Serum. A. I. van Saun, Albany, N. Y.—p. 61.
55 Method for Making Graphic Records of Movements of Certain Internal Organs. D. E. Jackson, St. Louis.—p. 63.
56 *Simple Method of Obtaining Blood Serum. M. G. Wohl, Omaha.—p. 68.

45. **Antityphoid Vaccination and Agglutination Test.**—The total number of quantitative tests performed by Rist from February to November, 1915, amounted to 11,648. He found that in nonvaccinated individuals the agglutination test is of the greatest practical value for diagnosing infection caused by the bacilli of the typhoid group. But, when it comes to discriminate between the three subspecies belonging to that group, the information given by the Widal test should be accepted with great caution. A predominance of the agglutination titer of *B. paratyphoid* A or B speaks almost certainly in favor of *B. paratyphoid* A or B. But if the agglutination titer of *B. typhosus* predominates, the probability of the disease being due to *B. typhosus* is only 73.3 per 100. In individuals having been previously vaccinated against *B. typhosus*, the agglutination test is absolutely unable to confirm a clinical diagnosis of typhoid. The behavior of the agglutination titer in vaccinated typhoid or paratyphoid patients is not distinguishable from the behavior of the same titer in vaccinated individuals suffering from any other disease. In a case of clinically confirmed typhoid occurring in a previously vaccinated individual, the agglutination test has a practical diagnostic value whenever it shows a constant predominance of the agglutination titer for one of the paratyphoid germs. But this is a very rare finding. In the greater majority of cases the agglutinating titer for *B. typhosus* predominates. It has no diagnostic value, the probability of mistaking paratyphoid for typhoid being slight. Blood culture is therefore the only reliable method to ascertain whether a typhoid infection occurring in a vaccinated person is due to *B. typhosus* or to one of the paratyphoid germs.

46. **Antibodies in Gonococcal Arthritis After Protein Injection.**—It is shown by Culver that primary and secondary proteose preparations stimulate antibody production or mobilization for specific organisms in gonococcal arthritis in a

manner not to be distinguished from that produced by the injection of the specific organisms themselves. In gonococcal arthritis there is either no change or a decrease in the antibody content of serum within the first twenty-four hours following an intravenous injection in all excepting the first injection when the lytic substances seem to be slightly increased during this time. In favorable patients the first injection usually causes the greatest clinical benefit. However, refractory patients may give a similar lysin increase during the first twenty-four hours following an injection; hence the subjective and objective improvement in favorable cases cannot unquestionably be attributed to an increase in antibodies alone.

47. **Blood and Urine Ammonia in Acidosis.**—During the course of routine analyses for urea of the blood of a chronic alcoholic, who was suffering from repeated periodic attacks of nausea and vomiting of unknown etiology, an estimation of his blood ammonia was made, and it showed an ammonia content of 23 mg. of ammonia per hundred cubic centimeters blood. Similar analyses were made in cases of nephritis, cardiac failure, chronic diseases of the liver, toxemias of pregnancy and acidosis. Increases of blood ammonia of above 1 mg. per hundred cubic centimeters are ocasionally encountered in various diseases. Such increases cannot be explained by acidosis in all cases. The fact that nine cases showing marked increases (over 3 mg. per hundred cubic centimeters), which have come to necropsy, have shown definite hepatic lesions would suggest some connection between increased blood ammonia and functional insufficiency of the liver. The fact that of ten chronic and subacute cases of inflammatory disease of the liver studied only one has shown an increase of blood ammonia would indicate acute functional insufficiency of the liver cells rather than acute or chronic inflammatory changes in the liver parenchyma as the source of any blood ammonia increase.

48. **Infectious Meningitis.**—The most important lesson to be drawn from this study concerns lumbar puncture and spinal fluid. Correct antemortem diagnoses were established in 100 per cent. of cases in which proper lumbar punctures and spinal fluid examinations were made. Correct antemortem diagnoses were not established in 70 per cent. of cases in which proper lumbar punctures and spinal fluid examinations were neglected. Graves advises that in drawing spinal fluid the second portion should always be collected in a separate, clean, dry, sterilized test tube. Any blood in the specimen to be examined renders findings unreliable, wastes time and material and may lead to incorrect conclusions.

49. **Prevention of Simple Goiter.**—In a complete census taken by Marine and Kimball of the condition of the thyroid in the girls from the fifth to twelfth grades of the school population of a large community in the Great Lakes goiter district, it was found that 1,688, or 43.59 per cent., had normal thyroids; 2,184, or 56.41 per cent., had enlarged thyroids; and 594, or 13.4 per cent., had well defined, persistent thyroglossal stalks. The community lies near the southern edge of the goiter district and it is suggested that communities near the lakes would show a higher incidence. The following method of prophylaxis proposed is in operation. For the prophylactic treatment the authors have selected sodium iodid on the grounds of economy and ease of administration. One mg. of iodin given weekly, by mouth, is ample to prevent goiter in dogs. In all their dispensary experiments with children the authors used either syrup of hydriodic acid or syrup of ferrous iodid, in 1 c.c. doses, daily for two to three weeks, repeated twice yearly. They have, therefore, arbitrarily selected to use 2 gm. sodium iodid, given in 0.2 gm. doses each school day, for each pupil in fifth, sixth, seventh and eighth grades; and 4 gm. given in 0.4 gm. doses each school day for each pupil in the ninth, tenth, eleventh and twelfth grades. These amounts will be given twice annually about the first of May and December, at the schools by the teachers or nurses. These amounts of sodium iodid provide approximately 1,700 (1,692) mg. of iodin for each pupil of the fifth, sixth, seventh and eighth grades and approximately 3,400 (3,384) mg. for the ninth, tenth, eleventh and twelfth grades.

50. **Transplantation of Thymus.**—The preliminary experiments reported on by Marine and Manley show that in sexually immature rabbits, fragments of thymus autotransplanted into the subcutaneous tissue of the abdomen after thymectomy may "take," grow and survive. There is clear though scant evidence in confirmation of other observers' results, that thymus removal hastens sexual maturity. Also, as others have found, utilization of rabbits for breeding hastens involution of the thymus. The authors' experiments show that this applies to the transplanted thymus as well, and this suggests that a specific nerve influence is not essential for these involutionary changes.

51. **Besredka's Antigen in Tuberculosis Complement Fixation Test.**—As for the percentage of the occurrence of the reaction in different stages of tuberculosis when a purified antigen of Besredka is used, Bronfenbrenner presents these approximate figures: first stage, 84 per cent.; second stage, 94 per cent.; third stage, 15.3 per cent.; clinically nontuberculous (controls), nonsyphilitics, 5 per cent. The question of surprisingly low percentage of positive results in far advanced cases was especially investigated. In addition to the Besredka antigen, Bronfenbrenner examined a large group of such cases (from Leech Farm, Pittsburgh), with the antigens of Craig, Corper and Calmette, and more recently also with antigen of Miller. Although it was possible to observe a slight variation in the results obtained with respective antigens, in general they reacted no better than that of Besredka.

54. **Wassermann Test with Large Amounts of Serum.**—The use of a large amount of serum does not, in van Saun's experiences, change a serum giving a negative reaction to one giving a positive if a double serum control (0.8 c.c.) is used and the result of the test read only when this control is completely hemolyzed. In a number of tests she has found that the 0.4 c.c. control has been extremely slow to hemolyze, and has occasionally fixed complement completely. This result appears to point to a lack of specificity in a test depending on this amount of diagnosis. Van Saun does not consider the Kromayer modification a safe method to use for the practical examination of large numbers of serums.

56. **Simple Method of Obtaining Blood Serum.**—Wohl describes his method as follows: Place a small piece of paraffin (0.5 gm. is sufficient for an ordinary 6 inch serologic test tube) into a container that is ready for sterilization, cork it and sterilize it. On removal of container from sterilizer roll it so as to cover its walls with the paraffin. It takes only a few minutes until the thin film of paraffin is hardened. To clean the container, rinse it with cold water until all the blood is removed, melt the paraffin and pour off. The excess of paraffin is removed by means of a gauze applicator.

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57 Breast Feeding. M. S. Reuben, New York.—p. 793.
58 New Faradic Current Test for Incipient Cancer of Breast. G. B. Massey, Philadelphia.—p. 803.
59 Significance of Pyrexia in Infants. W. W. Harper, Selma, Ala. —p. 805.
60 Advancement in Obstetrics. M. T. Benson, Atlanta, Ga.—p. 806.
61 Capillary Caliber and Its Relation to Normal and Diseased States. W. V. Gage, Worland, Wyo.—p. 808.

Nebraska State Medical Journal, Norfolk

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62 Few Practical Points in Clinical Interpretation of Wassermann Reaction and Its Value in Lesions of Stomach. M. G. Wohl, Omaha.—p. 445.
63 Popular Consideration of Syphilis. F. E. Coulter, Omaha.—p. 451.
64 Intraspinous Medication in Syphilis. E. Kelly, Omaha.—p. 454.
65 Dementias of Young. B. F. Bailey, Lincoln.—p. 458.

New York Medical Journal

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66 Some Aspects of Military Surgery. H. B. Barling.—p. 869.
67 Repair of Flatfoot, Broken Arch, or Rheumatism of Feet, Especially in Recruits. J. M. Taylor, Philadelphia.—p. 872.
68 Traumatic Hysteria. C. P. Oberndorf, New York.—p. 874.
69 Clinical Observations from Study of Three Hundred and Seventy-One Cases Presenting Symptoms of Nephrolithiasis. R. F. O'Neil, Boston.—p. 876.
70 Factors of Race Improvement. C. L. Redfield, Chicago.—p. 882.
71 Case of Amaurotic Family Idiocy. J. Epstein, New York.—p. 887.
72 Some Functional Inefficiencies of Teeth Associated with Occlusal Anomalies. M. Hellman, New York.—p. 889.

Philippine Journal of Science, Manila

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73 *Degeneration of Peripheral Nerves. C. Manalang, Manila.—p. 169.
74 Disappearance of Pigment in Melanophore of Philippine House Lizards. E. S. Ruth and R. B. Gibson, Manila.—p. 181.
75 *Essential Factor in Treatment of Pregnant Cholera Patients. P. McC. Lowell, Manila.—p. 191.
76 Echinostoma Ilocanum (Garrison): Report of Five Cases and Contribution to Anatomy of Fluke. J. S. Hilario and L. D. Wharton, Manila.—p. 203.

73. **Degeneration of Peripheral Nerves.**—The object of Manalang's work is to determine the presence of degeneration in the peripheral nerves of diseases other than beriberi and to emphasize the presence of the degeneration in non-beriberics. In a mixed necropsy service in Manila 88 out of 104 cases showed microscopically degeneration of the peripheral nerves by the Marchi method. Of these 88 cases the degeneration was slight in 55, moderate in 29, and marked in 4. Of the 88 cases of nerve degeneration more than half (49) occurred between the ages of 20 and 50 years, but no age was exempt. Of the 88 cases of nerve degeneration there was nephritis of some form in 69. Manalang found that the condition of nutrition is not an important factor in determining the nerve degeneration, and a reasonable interval (two to forty-eight hours) between death and necropsy does not necessarily mean a sequential myelin sheath change, as demonstrated by the Marchi method. (These bodies were kept at a temperature just above freezing.) With the knowledge that this study was made from a routine necropsy service in Manila and that the subjects were all Filipinos, the following factors must be taken into consideration in attempting to explain the occurrence of degeneration in 88 out of 104 cases studied. In Manila beriberi is endemic, and therefore there is the possibility of many persons with unrecognized mild beriberi dying of other diseases. There may be many patients who recovered from beriberi and died of other diseases. The nutrition of the working class of Filipinos in general is below par, due to insufficient food, excessive non-nutritious food, or a one-sided diet.

75. **Treatment of Pregnant Cholera Patients.**—The essential factor in the treatment of pregnant cholera patients according to Lowell is to remove the dead fetus as soon as possible and in the manner best suited to the mother's condition, because it shortens the period of convalescence, preserves the strength of the mother, and reduces the mortality to about that of the nonpregnant cases.

Southern Medical Journal, Birmingham, Ala.

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77 Acidosis in Children. F. H. Smith, Abingdon, Va.—p. 839.
78 Albuminate of Copper as Intravenous Antiseptic. J. S. Fleming, Memphis, Tenn.—p. 845.
79 Hirschsprung's Disease; Report of Case. R. W. Baird and G. C. Kindley, Dallas, Texas.—p. 846.
80 Two Cases of Swallowing Seven and a Half Grain Tablet of Bichlorid of Mercury. I. L. Van Zandt, Fort Worth, Texas.—p. 848.
81 Public Health and Government. E. G. Williams, Richmond, Va.—p. 850.
82 County Method of Handling Tuberculosis. D. C. Absher, Henderson, N. C.—p. 852.
83 Saving Sight—Saving Citizens. G. L. Berry, New York.—p. 857.
84 *Exstrophy of Bladder with Report of Transplantation of Entire Bladder and Ureteric Openings into Sigmoid. W. D. Haggard, Nashville, Tenn.—p. 862.
85 Unusual Case of Extra-Uterine and Abdominal Pregnancy. L. C. Fischer, Atlanta, Ga.—p. 866.
86 Treatment of Tetanus. J. H. Neff, Charlottesville, Va.—p. 868.
87 Roentgen Ray Diagnosis of Pathologic Gallbladder. G. M. Niles, Atlanta, Ga.—p. 873.
88 Indian Operation for Cataract. F. B. Tiffany, Kansas City, Mo.—p. 876.

84. **Exstrophy of Bladder.**—Haggard's patient made an uninterrupted recovery, passing a normal quantity of urine through the catheters, which protruded from the rectum and which were left in place for four days. After that time the patient passed the urine through the rectum at frequent intervals, which have gradually lengthened, until now at the end of three years she is able to retain the urine from three to four hours by day and from five to six hours at night. There has never been any leakage whatever. The anterior wound healed over completely. Her general health is unimpaired.

Southwestern Medicine, El Paso, Texas

October, I, No. 10

89 Blood Picture as Aid to Prognosis and Treatment in Tuberculosis. R. E. Thomas, Phoenix, Ariz.—p. 9.
90 Rollier's Method in Treatment of Pott's Disease. J. W. Flynn, Prescott, Ariz.—p. 11.
91 Military Surgeon. H. A. Ingalls, Roswell, N. M.—p. 14.
92 Roentgen Therapy and Tubercular Lesions. J. W. Catheart, El Paso.—p. 18.
93 Autosensitized Serobacterin. W. O. Sweek, Phoenix, Ariz.—p. 21.
94 Dentistry's Share in Preparedness. E. P. Tignor.—p. 25.

South Carolina Medical Association Journal, Greenville

October, XIII, No. 10

95 Roentgen Ray Diagnosis of Chronic Appendicitis. A. R. Taft, Charleston.—p. 693.
96 Use of Dakin's Solution in Gangrenous Endometritis, Following Puerperal Sepsis. B. J. Workman, Charleston.—p. 704.
97 Uterine Evacuations, Elective and Enforced. Cesarean and Porro Operations. Report of Cases. S. O. Black, Rochester, Minn.—p. 707.
98 Postgraduate Course in Anatomy at Home. W. F. R. Phillips, Charleston.—p. 710.

Vermont Medicine, Rutland

October, II, No. 10

99 Diagnosis. C. H. Beecher, Burlington.—p. 233.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

October, XXII, No. 5

1 Electrotherapy in Military Hospitals. N. H. M. Burke.—p. 130.
2 Treatment of Wounded by Means of Electricity. H. J. Seeuwen.—p. 136.
3 Shrapnel Balls; Their Roentgen Ray Characteristics Compared with Bullets and Other Foreign Bodies. A. H. Pirie.—p. 138.

British Medical Journal, London

October 27, II, No. 2965

4 Harvey's Work Considered in Relation to Scientific Knowledge and University Education in His Time. R. Saundby.—p. 543.
5 *New Operation for Cure of Inguinal Hernia.—A. J. Hull.—p. 548.
6 Modern Artificial Limbs and Their Influence on Methods of Amputation. E. M. Little.—p. 550.
7 How to Attach an Artificial Arm or Leg. R. C. Elmslie.—p. 553.

5. **New Herniotomy.**—The operation described by Hull aims to remove the sac at the heighest possible level with the minimum disturbance of tissue. No dissection of tissues is undertaken, or injuring the delicate or important structures which surround a hernial sac by attacking the hernia from within the sac. Under local anesthesia an incision from half an inch to an inch in length is made and carried down to the aponeurosis of the external oblique. The fibers of the external oblique are split for a distance of half an inch. The opening in the external oblique should lie directly over the spermatic cord. The cremasteric and spermatic fascial coverings of the cord are drawn through the aperture of the external oblique. The cremasteric fibers are separated and the spermatic fascia incised. Two pairs of fine hemostatic forceps are placed on the edge of the sac, and an incision half an inch in extent, made between them by a snip of a pair of scissors. The two layers of the sac forming the lips of the aperture are now clipped with hemostatic forceps. The aperture can now be held open by four pairs of forceps, and four incisions are made, one between each pair of forceps, enlarging the aperture sufficiently to display the interior. If omentum lies in the sac it is drawn out, ligatured, and cut off. This interior of the sac presents for examination two apertures, one the internal ring passing into the abdomen, the other passing down the inguinal canal. These apertures are separated from one another by a process of peritoneum, the crista which corresponds to the internal margin of the internal ring. The neck of the sac is exposed and freed without

dissecton. A gauze swab is gently passed down the outer and inner side of the sac. A gentle pull is made on the neck of the sac while it is ligatured as high up as possible. It is unnecessary and undesirable to perform any displacing maneuver to the neck of the sac. When the sac is cut off distal to the ligature, the elasticity of the peritoneum will displace the ligatured sac well behind the rectus muscle. In 90 per cent. of cases this is all that it is necessary to do, and the skin incision is sutured with silkworm gut passing down to, and taking up the edge of the external oblique.

Indian Medical Gazette, Calcutta

September, LII, No. 9

8 Ulcerating Granuloma of Pudenda. D. F. Curjel.—p. 305.
9 Plea for Painless Childbirth in India. C. Webb-Johnson.—p. 310.
10 Early Diagnosis of Leprosy. C. L. Palk and R. Bryson.—p. 316.
11 Treatment of Kala-Azar with Antimony Tartrate. E. Muir.—p. 317.
12 Treatment of Kala-Azar and Some Blood Reactions in This Disease. U. N. Brahmachari.—p. 319.
13 Intravenous Eusol in Plague. W. F. Brayne.—p. 322.
14 Quinin Idiosyncracy in Five Cases. J. A. Sinton.—p. 323.

Lancet, London

October 27, II, No. 4913

15 Harvey's Work Considered in Relation to Scientific Knowledge and University Education in His Time. R. Saundby.—p. 633.
16 *Treatment of Trench Feet and Allied Conditions by Bier's Method of Passive Hyperemia. P. Turner.—p. 638.
17 *Treatment of Series of Recently Inflicted War Wounds with Flavine. H. Drummond and J. W. McNee.—p. 640.
18 Ether-Oil Anesthesia by Rectum. H. M. Page and G. B. M. White.—p. 643.
19 Cartilage Prosthesis for Eye. J. L. Aymard.—p. 644.
20 Departmental Committee on Welfare of Blind. A. Lawson.—p. 634.

16. **Trench Feet Treated by Passive Hyperemia.**—Turner's experience with this form of treatment has been satisfactory to him. In slight and moderate cases the swelling of the foot has usually disappeared in twenty-four or forty-eight hours after the application of the bandage. In severe cases it may persist longer. Pain improves rapidly, and in twenty-four hours has either disappeared or has markedly diminished. Anesthesia improves steadily, but not so rapidly. In a moderate case with anesthesia of all the toes and of the greater part of the dorsum of the foot the sensation will probably be normal in four days, with the exception of blisters and gangrenous spots where the sensation is naturally still deficient. In cases of moderate severity blisters and the gangrenous areas shrivel, dry up, and eventually separate, leaving an unbroken delicate pink skin underneath. Not infrequently there is an extensive desquamation of the skin of the affected part, sometimes of practically the whole foot. In extensive cases, after the separation of dried blisters, gangrenous spots, and epithelial scales, there is left a surface of thin, pink, soft skin resembling a baby's foot. This is naturally very tender, and though the patient can walk in soft shoes, boots cannot be worn until the thin skin has become hardened and accustomed to pressure. Turner regards this desquamation and separation of dried gangrenous areas as part of the natural process of cure in these cases of moderate severity, and thinks that the treatment by passive hyperemia considerably accelerates the process. In slight cases, as soon as pain, swelling and anesthesia have disappeared, usually after four or five days, the patient is allowed to walk in soft shoes. Then after two days boots are worn at first for half an hour daily. This period is gradually increased until the boots can be worn for two hours without discomfort, when the man is discharged to the convalescent depôt. In moderate cases the procedure is the same. A longer period is, however, required before walking is possible and before boots can be worn. Severe cases always require evacuation to England.

17. **War Wounds Treated with Flavine.**—This is the authors' report to the medical research committee. Flavine was tested out by Drummond and McNee clinically as well as in the laboratory. Seventy patients, many having multiple injuries, were treated. The flavine was at first employed in a strength of 1 in 1,000, the dilution being made in normal saline solution, in which the powder is readily soluble. This routine was soon given up, however, as it was found that equally good results ensued if the use of 1 in 1,000 solution for the first dressing was followed by the employment of a solution 1 in 5,000 for all subsequent applications. In some cases, also, where the Carrel method of irrigation was being used, the strength of the solution was further reduced to 1 in 10,000. The surgical methods adopted depended on the type of injury met with. Long incisions, with free excision of damaged muscle and fascia, must be regarded as a cardinal part of all operative treatment in recent wounds, no matter what subsequent methods are employed. After this preliminary surgical treatment the wounds treated with flavine were dealt with in the following ways: 1. Primary suture. 2. Drainage by tube or gauze strip, followed by secondary suture. 3. The Carrel method of intermittent irrigation. 4. Gauze packing in open wounds. Wounds treated by excision of the infected and damaged tissue, followed by primary suture, gave excellent results.

Secondary suture gave good results in all the cases in which it was adopted. In open wounds on removal of the first dressing on the third day the wound, except for being deeply stained with flavine, has undergone no alteration whatever in its appearance, and resembles an injury only a few hours old. All signs of inflammation are wanting, and there is no pain, redness, swelling, or induration in the tissues around. The secretion from the wound is minimal in amount and suppuraton is absent. The complete absence of suppuration, even in wounds where films show abundant organisms to be present, is a noteworthy feature in wounds under treatment with flavine. When dressed again at the end of a week the skin edges are found clean cut, no epithelial growth having taken place from the edges. The floor of the wound has by this time become covered by a closely adherent membrane, only detached with difficulty from the underlying structures. This yellow pellicle forms over whatever tissue is exposed in the wound, whether it be muscle or subcutaneous fat. Experience has shown that a wound heals with much greater rapidity if the flavine be stopped after three or four days in the case of small wounds, and after about a week in the case of severe wounds or compound fracture.

Flavine appears to have many advantages as a primary treatment of recent war wounds. Among the advantages are: (*a*) The absence of all toxicity, even in large wounds. (*b*) The prevention of suppuration and of spreading sepsis. (*c*) The primary dressing need not be changed for two or three days, and is then easily and painlessly removed. This may be of great advantage during severe fighting where rapid evacuation of wounded from front to base is required without unnecessary dressing of the wounds. (*d*) The wounds are not inflamed or painful, and the surrounding skin is never irritated. Flavine cannot be classed as a success in the treatment of the later stages of war wounds. The wounds tend to assume a stagnant condition, during which the processes of repair are almost in abeyance. After a few days, when the danger of gas gangrene and of spreading sepsis have to a great extent passed off, flavine should be stopped and another treatment adopted. In the majority of cases war wounds are not rendered bacteriologically sterile even by the prolonged use of flavine. Test tube experiments carried out with organisms isolated from actual wounds bear out the strong antiseptic properties of flavine, and their enhancement in the presence of serum. Coliform bacilli which are a common infection in the later stages of wounds, are much more resistant to the action of the antiseptic in test tube experiments than any of the other types of organism examined in this way.

Medical Journal of Australia, Sydney

September 29, II, No. 13

21 Case of Systemic Blastomycosis-Blastomycotic Cerebrospinal Meningitis. H. Swift and L. B. Bull.—p. 265.
22 War Injuries of Ear. R. E. Shuter.—p. 267.
23 Occurrence of Mysterious Disease in Southern Queensland. A. G. Anderson.—p. 270.

October 6, No. 14

24 Prostatic Obstructions and Their Surgical Treatment with Special Reference to Two Stage Operation. S. H. Harris.—p. 285.

25 Establishment and Work of Commonwealth Serum Laboratories. W. J. Penfold.—p. 290.

October 13, No. 15

26 Morbid Anatomy of Insanity. W. A. T. Lind.—p. 305.
27 Rough Clinical Notes on Some Recent Interesting Surgical Cases. L. M. McKillop.—p. 308.
28 Case of Progressive Lenticular Degeneration. H. Swift.—p. 310.

Sei-I-Kwai Medical Journal, Tokyo

October, XXXVI, No. 10

29 *Fate of Starch Granules Injected into Rabbit's Vein. M. Okazaki. —p. 101.

29. **Fate of Starch Granules Injected into Rabbit's Vein.**—Okazaki says that starch granules injected into the rabbit's vein begin to present the glycogen reaction on the sixth day after the first injection of starch emulsion. This reaction can be demonstrated in the granules in the blood and within the histiocyte, but is more marked in the latter. On the basis of these observations Okazaki declares that the histiocyte has a diastatic action converting starch into glycogen.

Bulletin de l'Académie de Médecine, Paris

October 9, LXXVIII, No. 39, pp. 361-394

30 *Flying Surgical Units. Plisson and Quénu.—p. 362.
31 Discussion of Declining Birth Rate. Pinard and others.—p. 367. Continuation.
32 Treatment of War Wounds with Vincent's Hypochlorite Powder. J. Martin.—p. 388.
33 Strychnin in Large and Progressive Doses as Tonic after Extensive Wounds. P. Hartenberg.—p. 392.

30. **Flying Surgical Unit.**—Plisson's proposed *groupe chirurgical mobile* is already working at the front. The principle is to have the operative, the hospital and the administration sections separate, distinct and interchangeable. The operative section is also composed of separate interchangeable parts, each with its truck, one for sterilization, one for the surgical material, one for radiography, and one for the preoperative tent. The hospital section also is divided into interchangeable parts, each with its truck, carrying twenty beds and all other equipments for complete hospital service. The present unit comprises eleven trucks, but more can be added at need as each truck is complete in itself; the personnel of the unit, including the fifty-two nurses, travel by automobiles. This flying unit is thus autonomous and extensible. As it travels on its own power it is independent of traffic, and can be swiftly moved to points where its services are most required.

Journal de Chirurgie, Paris

XIV, No. 2, pp. 113-216

34 *Resection of the Hip Joint for War Wounds. P. Alquier and J. Tanton.—p. 113.

34. **Resection of Hip Joint.**—Alquier and Tanton give an illustrated description of twelve cases in which from eight to twelve months have elapsed since they resected part of the hip joint above the head, or through or at the base of the neck, or through or below the trochanter. In only one of the twelve cases was the resection primary. In all but two, infection was already installed after the comminuted fracture of the upper end of the femur. Their experience demonstrates that it is possible with an early and complete operation to realize the aseptic healing of a war fracture of this kind. The after care is as important as the operation itself. They get the man on his feet even before the wound has quite healed, the foot hanging loose in a walking cast. If there is danger of talus equinus they have a sole fitted in the stirrup which holds the foot horizontal. A celluloid cast replaces the open plaster cast when the man gets up, and crutches are gradually discarded early. The cases are reported in detail, the outcome justifying the conclusions that even extensive resection of epiphysis and shaft may give good results, the joint solid and free from pain, with possibly some slight functioning of the new joint provided the resection is done at a secondary operation, subcapsular and subperiosteal, at the period of most active bone regeneration. They sacrificed an extent of bone from 12 to 18 cm. long, and their confidence in the ultimate anatomic and functional repair was justified by the outcome in the young men. In only one of their cases was the man left with a loose fibrous pseudarthrosis, and this has been partially corrected by a celluloid corset. The other men with solid ankylosis walk without difficulty; the sole of the shoe on that side is made thicker to balance the shortening of the leg.

Lyon Médical

October, CXXVI, No. 10, pp. 445-492

35 Hemorrhage from the Spleen; Two Cases. Briau.—p. 445.
36 Intravenous Vaccine Therapy of Typhoid. Petzetakis.—p. 449.

Paris Médical

October 6, VII, No. 40, pp. 273-288

37 *Ophthalmology in 1917. F. Terrien.—p. 275.
38 *Better Stumps for Artificial Eyes. (Amélioration des moignons oculaires en vue de la prothèse.) F. Terrien.—p. 277.
39 Advantages of Mercury Salicylarsinate in Treatment of the Eye and General System. A. Terson.—p. 282.
40 Choked Disk after War Wounds. A. Cantonnet.—p. 286.
41 Care of the Wounded after Operations. A. Mouchet.—p. 287.

37. **War Wounds of the Eyes.**—Terrien remarks in the course of this review of ophthalmology in 1917 that the visual disturbances of shell shock are generally transient, but that photophobia, spasmodic myopia, amblyopia or restriction of the visual field may be quite durable. Some think they are of hysteric nature. Vaccination against typhoid may bring on a relapse of iridocyclitis. As the uveal tract is so vascular, it is easy to understand how the vaccination may induce the localization there of casual infection, analogous to the oculoreaction to tuberculin. He has encountered one case of grave purulent iridocyclitis after the vaccination. Sometimes the vaccination started up metastatic ophthalmia, herpes of the cornea or infectious trigeminal neuritis, in those already bearing the seeds of such. Glaucoma secondary to iridocyclitis may rupture under the influence of the reaction to the vaccination. A reaction on the part of the meninges might entail lesions of the optic nerve and tract or ocular paralysis. Morax has warned that a primary acute glaucoma might rupture under the reaction to the vaccine, but he knows of no scientific reason why chronic glaucoma should be aggravated by it. To admit a causal connection, the aggravation must have occurred at the time of or soon after a reaction violent enough to modify the temperature. Ophthalmoscopic and medical examination should precede the vaccination, and he advises exclusion of all with syphilis, tuberculosis, or joint troubles when there is a history of lesions of the uveal tract, especially in persons over 35 or 40. The strict asepsis and antisepsis with war wounds have rendered sympathetic ophthalmia of less frequent occurrence than was anticipated, but a few cases have been encountered. Possibly they might have been more numerous if the patients had been kept under observation longer. A sympathetic reaction is comparatively common, appearing early and disappearing after enucleation. The poisonous drift gases may induce iritis or neuroretinitis, but the course has proved essentially mild.

38. **Need for Protection of Soldiers' Eyes.**—Terrien expatiates on the importance of a good fitting artificial eye for the later welfare of the wounded, saying that the question of better stumps is growing more and more important as the number of eyes injured beyond redemption is unfortunately increasing every day. This is owing to the more intensive use of grenades and small shells which break up into large numbers of small fragments, and the lack of any device to protect the eyes. No practical means has been found to protect the eyes, and yet, according to his latest notes, 92 per cent. of the perforating injuries of one or both eyes were made by such small flying fragments that the slightest protecting device would have turned it aside and saved the eye. A thin metal shell with a slit permits excellent vision while it would save the eyeball in the majority of cases. The Société d'ophthalmologie adopted in June, 1916, a resolution setting forth the advantages of some such device to protect the eyes, and the authorities conceded the correctness of the principle, but nothing to speak of has been done toward its realization in concrete form. The various measures necessary to ensure a good stump are described in detail, bearing in mind that the withered eyeball itself is the best stump of all.

Presse Medicale, Paris

September 24, XXV, No. 53, pp. 545-560

42 Protection of the Child among the Ancient Romans. IV. E. Jeanselme. Titlepage.
43 *Rebellious Fistulas in the Thorax. L. Bérard and C. Dunet.—p. 545.
44 *Practical Treatment of Syphilis. P. Chevallier.—p. 547.
45 *Tetanus and Tetanophobia. M. Couteaud.—p. 550.
46 *Hot Air Douches in Treatment of War Wounds. J. Bandaline and J. de Poliakoff.—p. 551.
47 *Graduated Spiroscopic Exercises in Training the Respiratory Apparatus. J. Pescher.—p. 552.
48 American Method of Anesthesia by Insufflation. J. Luzoir.—p. 555.

43. **Rebellious Fistulas in the Thorax.**—Bérard and Dunet show by several roentgenograms that often the reason why a fistula persists after a war wound of the chest is that some of the ribs have become soldered together by infected callus. Nothing short of resection of the pathologic tissues will ensure the healing of these fistulas. Roentgenoscopy will reveal the callus and thus permit effectual treatment.

44. **Practical Treatment of Syphilis.**—In concluding this presentation of the present status of treatment of syphilis, Chevallier emphasizes that treatment, even vigorous treatment, which is not kept up for years, does not protect against relapses. He insists that the action of soluble mercurial salts can be only transient. The insoluble salts ward off recurrences better as their action is prolonged longer. Recurring manifestations of the syphilis generally appear first on mucous membrane. The drugs should be given in the largest doses that can be borne without disturbances or only minimal disturbance, and the physician must keep in close touch with the patient. The physician must back up the patient's flagging will, and for this reason among others it is best to give the drugs by injection. The patients generally return to complete a definite course of injections. When it is concluded, he gives a card with the date when the next series of injections has to begin. There is only one contraindication, namely, impermeability of the kidneys. The intervals between courses should never be longer than six weeks. His course of arsenobenzol begins with 0.3 gm. once a week, increasing to 0.75 or 0.9 gm. by the fifth or sixth week and then dropping down again. The rich and the indigent are provided for, he says, but to date no provision has been made for the demi-indigent—those accustomed to paying for medical care at some sacrifice, but unable to bear the expense of four years of treatment. Arrangements must be made for these demi-indigent. Possibly the best plan to avoid infringement on professional secrecy would be to have a dispensary devoted to "chronic diseases"—for all affections which by their persistency condemn the demi-indigent to ruin or abandonment of treatment.

45. **Tetanophobia.**—Couteaud says that in his district every one who gets even the slightest kind of a wound, civilians and soldiers alike, rush to the hospitals for an injection of tetanus serum. The nurses are kept injecting it all the time, so it is flowing in a constant stream. He deplores this as a waste which may deprive the legitimate cases of the precious serum. It is a pity that bacteriologists as yet have been unable to detect in the blood the antitoxic elements which would reveal whether the wounded person is fitted or not to resist the tetanus germs. He is confident that there must be something of the kind, as farmers so seldom develop tetanus although so often exposed to it. We might learn something in this line by comparing the incidence of tetanus after war wounds among soldiers recruited from towns and those from rural districts, whether there is not a professional physiologic vaccination from repeated small inoculations.

46. **Hot Air Douches in Treatment of Torpid War Wounds.**—This communication from a base unit on the southwestern coast reports continued fine results from the jet of hot air turned on lesions in soldiers that refuse to heal promptly, especially the effects of frostbite of the feet and torpid infectious processes in general. The germ count is made before and after the hot air douche, to keep control of the progress, the findings confirming the prompt sterilization of the tissues and the speedy healing thereafter. The importance of having arrangements for acrothermotherapy as an adjunct to every surgical service is emphasized, and an illustrated description of a few cases is given to show the immediate benefit in the relief of pain and the prompt healing of lesions that had been dragging along for months.

47. **Therapeutic Spiroscopy.**—Pescher's spiroscope has already been described in these columns, and he here shows how it can be systematically applied in training the respiration. The long blow tube enters at the side, low down, of a bottle filled with water. The bottle stands on a standard and can be emptied completely at a single blowing by a person with normal lungs. The bottle is graduated, and the individual can see at a glance his respiratory capacity, and can watch it increase as training with this spiroscope expands the breathing area of his lungs. A stopcock on the tube allows the breathing exercises to be graduated for hyperfunctioning. In every case of war wound of the chest, there comes a time when these spiroscopic exercises are extremely beneficial. Also in pleurisy, and especially for persons who seem to be candidates for pulmonary tuberculosis. When the bulbar respiration center has been progressively inhibited by repeated nervous shocks, it may function so sluggishly that the whole system suffers from lack of the normal vigor of the respiratory movements; the resulting anemia, autointoxication or neuropathic depression all show marked improvement under spiroscopic training of the respiratory apparatus. The fact that the patient can see for himself by the drop in the water content of the jar just how he is progressing, gives zest to the exercises.

Progrès Médical, Paris

September 22, XXXII, No. 38, pp. 311-320

49 Three Neuromuscular Syndromes. H. Gougerot.—p. 311.
50 *Spontaneous Rupture of Heart. J. Tapie.—p. 314.
51 Medicine in Recent Fiction. P. Voivenel.—p. 315.
52 Propaganda of Hygiene by the Profession. A. Satre.—p. 317.

September 29, No. 39, pp. 321-330

53 Trench Foot. Renard and P. Blum.—p. 321.
54 Regional Anesthesia of the Arm. H. P. Achard.—p. 323.
55 *Suprarenal Symptoms in Malaria. C. Garin, Sarrouy and Pouget.—p. 324.
56 Pathology of the Senegalese Troops Now in France. Ardoin and Bonnette.—p. 326.

50. **Spontaneous Rupture of the Heart.**—Necropsy disclosed that the spontaneous rupture at the apex in a man of 49 was result of infarction from atheroma and thrombosis of the anterior coronary. The man was robust, with no specific pathologic antecedents, but for a few months had had asthma and symptoms of asystole and albuminuria.

55. **The Suprarenals in Malaria.**—Garin and his co-workers report that 4 per cent. of a group of 590 men with malaria presented symptoms showing that the suprarenals had been damaged by the infection. Their extreme pallor and lassitude, blanching of the mucosa, changes in pigmentation, emaciation, anorexia and resistance to the effect of a change to the mountains, testified to the suprarenal insufficiency. The general depression of the whole organism was shown by the tardy recuperation after the attacks, and the slight benefit apparent under tonics until epinephrin or suprarenal tissue tablets were given in addition. The prompt improvement then was striking.

Revue de Médecine, Paris

XXXV, No. 2, pp. 73-132

57 *Deficiency Diseases. (Les maladies par carence.) E. Weill and G. Mouriquand.—p. 73. Commenced in No. 1, p. 1.
58 War Epidemics of Typhoid Group. D. Olmer.—p. 108.

57. **Deficiency Diseases.**—Weill and Mouriquand's monograph contains an account of much experimental work besides extensive clinical experience. They discuss in detail the deficiency disturbances that developed in pigeons fed with decorticated or sterilized cereals, peas and beans; also the beriberi and experimental scurvy in animals under similar circumstances. They discuss further the deficiency in vitamins or ferment substances in relation to the army ration and the question of bread making. Among their conclusions from this and preceding research are that beriberi cannot be ascribed to decorticated rice alone, as similar hulling of all other grains and legumes is liable to bring on the symptoms of beriberi. Even sterilization of the unhulled grains may bring on the same set of symptoms. The nervous mani-

festations from these deficiency disturbances open a new chapter of pathogenic neurology. They reiterate that "life is necessary to life," and that a rational diet should include the digestible maximum of fresh, "living" foods. The use of ultra refined flour, of sterilized meats, vegetables, milk, etc., kept up too long and too systematically, may be responsible for deficiency disturbances beyond those that fit into the clinical frames of scurvy in young and old, and beriberi.

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 6, XLVII, No. 40, pp. 1329-1360

59 *Dangers and Treatment of Placenta Praevia. A. Labhardt.—p. 1329.
60 *An Embryonal Growth Center in the Crystalline Lens. (Ein embryonaler Kern der menschlichen Linse.) A. Vogt.—p. 1342.
61 *Practical Diagnosis of Duodenal Ulcer. F. Fortmann.—p. 1349.

59. **Placenta Praevia.**—Labhardt reiterates the vital importance of absence of infection when cesarean section is contemplated. Also that cesarean section is the only safe and reliable method for delivering a woman with placenta praevia without injury to the child. Hence the practitioner should get the woman to the hospital as quickly as possible and not allow any internal manipulations, tamponing, etc. All other methods of treatment show a high mortality among the mothers and a frightful mortality among the children, in spite of every effort. To be done under the best conditions, the cesarean section should come early in labor, and the child be extracted before the lower segment of the uterus has been much distended. By this prompt extraction before the placenta becomes separated, we ward off hemorrhage and atony of the uterus after delivery. In the hands of many obstetricians cesarean section has come to have no mortality. It has the further advantage that no germs from the vagina are carried up into the uterus as there is no necessity for version or the inflatable bag. As the uterine vessels are not gaping so much at this time, the danger of air embolism is correspondingly reduced. The general practitioner should insist on the woman's going to the hospital at the first bleedings, whether they occur just before or during labor; he should refrain from internal examination and especially from any tamponing. In the hospital, indications can be met as they arise.

60. **Anatomy of the Crystalline Lens.**—Vogt explains that the posterior surface of the crystalline lens is liable to show grooves and linear elevations indicating some disturbance in growth. There may be whitish lines and other anomalies suggesting an embryonal center of growth. They are found even in children, and he argues that they have something to do with the development of cataract.

61. **Diagnosis of Duodenal Ulcer.**—Fortmann refers to the diagnosis by the general practitioner without laboratory aid, and expatiates on the importance of prompt differentiation of duodenal ulcer. Much loss of flesh and nervousness were prominent symptoms in all his cases, with one exception. One of his patients had correctly diagnosed his own trouble from the clinical picture as he had found it described in a "doctors' book." Blood in vomit or stools may confirm the diagnosis and render radiography superfluous. He advises to have the patient refrain from meat for eight or ten or twelve days before applying the test for occult blood. All such tests have the disadvantage of being disconcertingly sensitive. Repeated negative findings with careful technic are correspondingly instructive as they exclude an ulcer. Hyperacidity is the rule with duodenal ulcer, but anacidity has been encountered by Stierlin and himself, and fluctuating findings in some cases. The practitioner may find Friedreich's swallowed-thread test instructive when the stomach content cannot be obtained directly. He always found the hunger pain, night pain and periodicity of the pains spreading toward the right in the liver region and back. The tender point is two or three fingerbreadths to the right of the median line, outside of the gallbladder, inside of the pylorus point. In one of four cases described in detail, the tender point was to the left of the median line. A second tender point is sometimes found at the end of the right twelfth rib. One of his patients had paid no attention to the pains, which were rather mild, until she had a stool black with blood. Vomiting of blood may occur with duodenal as well as with gastric ulcer. Advanced age does not always turn the scale in favor of cancer; one of his patients was 63, and cases are known with ages older than this. One of his patients, a man of 43, had had symptoms typical of duodenal ulcer for six and a half years when there was severe hemorrhage. There had never been any signs of gastrectasia, but the operation revealed that the ulcer was in the pylorus region. In another case the typical symptoms in a man of 30 had lasted for some time but the stools and radiographic findings were negative. He is evidently a "duodenal-ulcer neurasthenic," and Fortmann remarks that we may expect to encounter such more frequently as the "duodenal triad" is becoming known to the laity.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 4, XXXVIII, No. 79, pp. 1065-1072

62 *Intramuscular Serotherapy in Cerebrospinal Meningitis in Children. F. Fanciulli.—p. 1069.

October 11, No. 81, pp. 1089-1096

63 Acute Pancreatitis. M. Maurizi.—p. 1091.

62. **Serotherapy in Epidemic Meningitis in Children.**—Fanciulli remarks that no serum as yet, by any technic, can do miracles, and the fulminating cases terminate fatally as before. But under other conditions serotherapy can be counted on. He tabulates the details of eleven cases in children in which he injected 10 c.c. morning or evening or both, up to a total of 30 or 40 c.c. in the graver cases, with prompt recovery in all but one child who was left with intermittent fever and chills and enlarged spleen. The children were all treated at home, without isolation or disinfection of the premises beyond having the bed linen boiled. There was no second case in any of the families. Another child was moribund when first seen and no attempt at serotherapy was made. He injected the serum into a muscle.

Policlinico, Rome

October 7, XXIV, No. 41, pp. 1233-1256

64 The Hospital Centers for Specialist Work. Editorial.—p. 1233.
65 *The Subnormal Arterial Pressure with Abdominal Wounds. A. Chiasserini.—p. 1238.
66 Lactic Acid Bacilli Ferments in Therapeutics. G. Monti.—p. 1240.
67 Infant Feeding in Foundling Asylums. O. Viana.—p. 1243.

65. **The Subnormal Arterial Pressure with Abdominal Wounds.**—Chiasserini's long experience with war wounds of the stomach and abdomen has convincingly demonstrated, he says, that the character of the pulse is the guide to treatment, whether to operate or not, and it also affords a basis for the prognosis. He made a special study of the suprarenals from ten men who had died from wounds of the gastro-intestinal tract, securing them a few hours after death. Changes in the suprarenals were constant; they were like those found in diphtheria, all testifying to grave toxic action. When, with an abdominal wound, the pulse is small and fast, and persists thus in spite of measures to combat shock, any operation is contraindicated unless the trouble is from acute anemia. The operation may be successful and the subjective condition good, but the pulse keeps growing worse.

Riforma Medica, Naples

September 15, XXXIII, No. 37, pp. 893-912

68 *Cause of Persistence of Bacilli in Typhoid Convalescents. I. Preti.—p. 893.
69 War Wounds of the Abdomen. O. Finzi.—p. 894.
70 Diphtheria Antitoxin in Treatment of Epidemic Parotitis. E. Salvaneschi.—p. 896.
71 *Treatment of Fracture of the Femur. B. Schiassi.—p. 897.
72 Present Status of War Psychoneuroses. G. Molinari.—p. 898.
73 *Cinematic Surgery: To Facilitate Vitalization of Artificial Limb. E. Aievoli.—p. 902.

68. **Low Agglutinating Power in Typhoid Carriers.**—Preti tabulates the data in thirty-five cases, showing the agglutination during the typhoid and again late in convalescence. When the agglutinating power from two to nearly five weeks after defervescence was 1:40, bacilli were found in the stools. None were found in the convalescents agglutinating at 1:80, 1:160 and 1:320 with the exception of two cases with

bacilli present the twenty-sixth and twenty-eighth days with agglutination at 1:80. Hence the persistence of the bacilli evidently depends on the proportion of antibodies present.

71. **Fractured Femur.**—Schiassi's "decalogue" as he calls it was summarized, November 24, p. 1835.

73. **Cinematic Surgery.**—Aievoli analyzes what has been accomplished to date in the attempts to make possible the direct control of artificial limbs by traction from muscle fibers. Vanghetti's pioneer work in this line of vitalization of artificial limbs was described recently, page 321.

Rivista di Clinica Pediatrica, Florence

October, XV, No. 10, pp. 505-560

74 *Pathologic Somnolency with Lesion in Midbrain. C. Francioni.—p. 505.
75 *Acetonemia. G. Guidi.—p. 549.

74. **Pathologic Somnolency in Young Children.**—Francioni's patients presenting this mesencephalic syndrome were a child of 3 years and an infant of 10 months. In both the somnolency over months was the most striking symptom, and necropsy in the second case confirmed the diagnosis of a brain tumor. It was found in the isthmus of the brain, a vast destructive lesion shutting off almost completely all connection between the front and the hindbrain. The superior nerve centers were thus apparently cut off from the inferior centers as by a laboratory experiment. Both children were tuberculous, with some tendency to internal hydrocephalus.

75. **Acetonemia in Children.**—Guidi comments on the difficulty at times of distinguishing between acute appendicitis and an attack of periodical vomiting with acetonemia. Palpation of the appendix region through the rectum is sometimes the only means to clear up the case. He advises in case of persisting doubt to remove the appendix. There is always a possibility that the two affections may be associated. Three cases are described in detail in which the profuse elimination of acetone by the breath and kidneys was accompanied by frequent vomiting and occasional severe diffuse pains in the abdomen, the pulse fast and small, and the children were restless and felt badly, and there was no stool. The abdomen was distended but this was uniform, and no specially tender points could be found. While the surgeon was studying the first case with the internist, all the symptoms suddenly subsided. No purgatives had been given but slight peristaltic movements were detected while the abdominal walls were not contracted. The acetonemia subsided under large doses of sodium bicarbonate by the mouth or rectum. There was no movement of the bowel until the fifth day, but by the end of the week the child seemed to be perfectly well again. This child and the second were under 3, the other was 6. This was the first attack of acetonemia in the last two cases; the first child had had at 18 months a similar attack of vomiting with abdominal symptoms. The intestines in the three cases seemed much dilated—evidently a paresis from the toxins in the blood. Guidi has encountered other cases of acetonemia in which there was paresis of the bladder and retention of urine, compelling catheterization, but these disturbances are always transient and disappear with the acetonemia.

Semana Medica, Buenos Aires

August 9, XXIV, No. 32, pp. 149-176

76 *Exclusive Carbohydrate Infant Feeding and Its Evil Effects. M. Acuña.—p. 149.
77 Treatment of Ankylosis by Interposition of Tissue. E. M. Olivieri.—p. 153. Continuation.
78 *Charitable Institutions at Buenos Aires. E. R. Coni.—p. 160. To be continued.
79 Ethyl Chlorid General Anesthesia. B. Echevarria, B. D'Ascoli and A. Iturrieta.—p. 162.

76. **Evils from Exclusive Carbohydrate Feeding of Infants.**—Acuña reports two cases of trophy from too exclusive carbohydrate feeding in infants about 6 weeks old, fatal in both. Such children have a good appetite and the digestion seems to be perfect, but they do not increase in weight and height. When they are less than 6 months old, they generally succumb even when changed to breast milk.

78. **The Charitable Institutions of Buenos Aires.**—Coni here gives the first of thirty chapters of his work on the hospitals, asylums and other charitable institutions of Buenos Aires. He says that so much has been done in this line of late years that Buenos Aires now compares favorably with Paris, London, Berlin and New York in this respect.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 1, II, No. 9, pp. 761-830

80 The Value of Vivisection for Medical Science. G. van Rijnberk.—p. 755.
81 *Roentgenotherapy of Surgical Tuberculosis. A. van Ree.—p. 767.
82 Enucleation of the Eyeball and Preparation for Wearing an Artificial Eye. H. J. L. Struycken.—p. 779.
83 Experimental Physiology in Relation to Psychology. F. J. Soesman.—p. 781.
84 Medical Statistics and Psychanalysis. D. S. Henkemans.—p. 786.
85 *Congenital Absence of Skin Reflexes and Tendon Reflexes. G. C. Bolten.—p. 788.

81. **Radiotherapy of Surgical Tuberculosis.**—Van Ree gives fifty-seven double illustrations showing the condition before and after roentgen treatment, mostly of tuberculous glands in the neck. In this group of tuberculous glands a complete cure was realized in thirty-five out of forty-eight; only two failed to show marked benefit. The cases showing mere improvement to date may go on to a complete cure in time. One great advantage of the treatment is that the healing proceeds without leaving disfiguring traces. From eight to ten exposures were the average course, some cases needing very few and others requiring a whole year. The exposures were about 4 H. units and the intervals about three weeks. These small doses do not modify the tissues around so as to make operative measures more difficult in case they are deemed necessary later. Tuberculous lesions in small bones healed promptly in seven of his thirteen cases of this kind. In one case of a tuberculous lesion in the sternum, the necrotic masses were excised, followed by smooth and rapid healing under the exposures. The benefit in some cases of bone and joint tuberculosis was so striking that further efforts in this line are encouraged even although this treatment failed in a certain proportion of the old cases, especially in adults. Certain experiences on record warn against exposing the larger joints of children to the roentgen rays as liable to interfere with normal growth later.

85. **Congenital Absence of Reflexes: Skin and Tendon.**—Bolten reported recently the case of an apparently healthy man of 22 in whom neither the knee-jerk nor Achilles reflex could be elicited. There was nothing to suggest tabes, and Bolten accepted the areflexia as a sign of degeneracy. This seems probable also in a second case here described at length. This patient was a woman of 30. She displays a slight neuropathic tendency and is somewhat nervous, but otherwise seems sound. None of the skin and tendon reflexes can be elicited. The periosteum reflexes are faint. As both persons seem normal in every other respect, the anomaly in regard to the reflexes can be explained, he thinks, only by assuming a congenital inferiority, that is, a more or less pronounced degeneracy. There was no trace in either case of hypotony or disturbance in the muscle sense.

Hygiea, Stockholm

LXXIX, No. 16, pp. 801-864

86 *Influence of Physical Training on the Morphologic Development of the Motor Nervous System. E. Agduhr.—p. 801.
87 *Influence of Posture on Physical Development of Schoolchildren. T. Resmark.—p. 829.

86. **Influence of Training on the Physical Development of the Nervous System.**—Agduhr reports a pronounced influence from systematic exercises on the development of the motor nervous system of young cats. Other kittens from the same litter had been kept in cages without much chance for exercise, and the difference was marked by the end of seven months. The training of the kittens consisted in their climbing up a long burlap curtain to a graduated height, and repeating at least a hundred times a day. Other tests were made on other warm and cold blooded animals. The findings apparently demonstrate that moderate graduated training of the growing individual causes hypertrophy of most of the

elements of the peripheral motor nervous system, and an increase in the numbers of fibers in the conducting tracts. The brain also grows to be larger than in the controls.

87. **The Habitual Posture of Schoolchildren.**—Resmark measures and compares the findings by means of a frame on a standard. The sides of the frame are marked off in centimeters for the height, and the top and bottom of the frame are marked off to each side from a central zero. The child stands in profile behind the frame, the camera at a fixed distance in front. The research was undertaken to study the influence of the habitual posture on the physical development of the child.

Norsk Magazin for Lægevidenskaben, Christiania

October, LXXVIII, No. 10, pp. 1129-1240

88 *Calcification of the Lungs. F. Harbitz.—p. 1129.
89 Extension Bandage without Plaster. S. Widerøe.—p. 1163.
90 The Heart Complications with Diphtheria. J. Holst.—p. 1167.
91 The Banti's Disease Question. C. Schiøtz.—p. 1176.
92 *Diabetes Insipidus. L. Nicolaysen.—p. 1184.

88. **Calcification of the Lungs.**—Harbitz has previously published some cases of calcium metastasis, calcium gout, and universal calcinosis. He here reviews these experiences and the literature on the subject, and reports the details of a case in which both lungs were so full of calcium that it is surprising that they were able to work at all. The lungs weighed six times the normal weight, and stood up on their own basis. The calcium was evenly distributed throughout, not in deposits around vessels. There had been no preceding destructive bone affection, so the calcification was primary and not metastatic. Six other primary cases are on record which he cites in turn. In his case the kidneys were sound but there had been chronic gastritis with occasional hematemesis. The patient was a woman of 41 with a history of acute articular rheumatism as a child and again three years before, and a chronic tendency to shortness of breath on exertion and to slight cyanosis. She entered the hospital on account of anasarca and ascites; the pulse was 104 and regular, respiration 34 and audible. There were 8,448,000 reds and 11,600 whites. Percussion showed resonance over the lungs with somewhat prolonged expiration and fine crepitation. The woman died in three weeks under the diagnosis of heart disease. The various theoretical possible causes for the extreme calcification of the lungs in this case are discussed, as nothing was found at necropsy to explain it.

92. **Diabetes Insipidus.**—In the first of the two cases reported, a previously healthy woman of 44 developed after her tenth pregnancy a condition of general weakness with tendency to obesity, polyuria, polydipsia and polyphagia. The same set of symptoms was presented by the second patient, a septipara of 34, subject to epilepsy. Tests with pituitary extract and abstention from fluids showed good concentration level. The polydipsia seemed to be primary and there were other features suggesting that the trouble was some disturbance in the centers in the third ventricle.

Ugeskrift for Læger, Copenhagen

September 6, LXXIX, No. 36, pp. 1479-1520

93 *Carbohydrate Dyspepsia and Xerophthalmia. H. Rønne.—p. 1488.

September 13, No. 37, pp. 1521-1564

94 *Historical Sketch of Prostitution during Various Wars. A. L. Fønss.—p. 1521. Commenced in No. 36, p. 1479.
95 Atresia of the Hymen with Rupture of Tube from Accumulation of Blood. J. E. Kieler.—p. 1538.

93. **Carbohydrate Dyspepsia and Xerophthalmia.**—Rønne, as an ophthalmologist, differs from both Bloch and Monrad whose views were recently summarized in these columns, Sept. 29, 1917, p. 1122. He relates that he has had cases of xerophthalmia in infants who had been fed casein and little carbohydrates. He emphasizes that untreated xerophthalmia is practically always fatal. The grave symptoms including the xerophthalmia come on suddenly, suggesting, he thinks, that lack of vitamins is probably responsible. An excessive carbohydrate diet could scarcely induce such a sudden and stormy onset of the xerophthalmia and other symptoms. No instance is known to him of carbohydrate dyspepsia, without xerophthalmia, proving so rapidly fatal. The immediate cause of death is the lowered resisting powers of the child (pneumonia), and he thinks there is much to sustain the assumption that both carbohydrate dyspepsia and avitaminosis are involved. Xerophthalmia is frequently but not always of dietetic origin. It may occur in the tuberculous. Here it seems to depend not on the intake but on the power of assimilation, the inability to utilize the requisite elements although they are supplied in the food. There seems to be an individual power of assimilation, as some children apparently do well on a diet that induces severe xerophthalmia in another.

94. **Prostitution in Wartime.**—Fønss traces the history through the ages of attempts to control the spread of venereal disease, and especially in armies and discusses what is being done during the present war in this line. Among the data cited is Dreyer's statement that 89 per cent. of the registered prostitutes in Berlin gave a positive Wassermann reaction, and Sperk's report that 772 prostitutes who had contracted syphilis were known to have had 2,135 recurrences during the first four years after infection. Fønss mentions that polygamy was introduced in Bohemia after the Thirty Years War. He regards as of great and practical interest the regulations in regard to prostitution promulgated in Austria since the war began. They specify with minute detail the prophylactic measures, the preliminary and terminal salves and rinsings which the prostitute must use herself and offer to her customer. The medical inspector must verify that she has the preservatives, etc., on hand. Fønss remarks that whether the minute directions are followed or not is a question, but the emphasis placed on them by the official decree impresses on all concerned the importance of preservatives.

He relates that the *Dermatologische Wochenschrift* Nos. 11 and 12, 1917, contains the report of a committee appointed by the Reichstag to study the venereal disease question. The main points of the report are the recommendations that professional secrecy should be abrogated when it is a question of venereal disease, that is, the case should be notified by name; that transmission by venereal disease should be penalized; and that the state examination for license to practice should include examination in skin and venereal diseases. Dreuw emphasized that the notification by name is absolutely impracticable unless it is to be made to a central federal bureau which will keep the records for the entire country, and organize uniform measures under the seal of strict secrecy except for the parties directly involved. Fønss adds that compulsory notification to the police of contagious venereal disease is already decreed in Schleswig-Holstein. In No. 9 of the *Wochenschrift*, Hecht published an appeal for the application to prostitution of the principle of the Gøteborg system for reducing the evils of the liquor trade, that is, placing the whole business in the hands of a central organization which aims to make only a small profit on the capital invested. Fønss remarks that this suggestion has much to commend it. It would thus be possible to ensure completely hygienic conditions free from pecuniary speculation. The privately owned brothel, he reiterates, must be stamped out.

Fønss relates that it was not until about 1600 that the connection between prostitution and disease in the soldiers was definitely recognized. Among the efforts to rid the army of the female camp followers he mentions Marshal Strozzi's drowning of 800 at one time in the river Loire (1570), and Gustavus Adolphus' promotion of marriage among his troops (1621). During the Thirty Years War, in 1648, history records that to the army of 40,000 soldiers entitled to rations there were 140,000 followers not on the ration list. The women aided in cooking the food, mending the soldiers' clothes and nursing them when sick. Johann of Nassau proposed in 1608 to substitute men nurses and cooks for women workers, alleging as the chief reason the prevention of infectious diseases. The French commander, Carnot, in 1793 drove away women followers of the camp to the number of 3,000, saying they did ten times more harm to the army than the enemies' guns. Fønss credits most of his historical data to I. Bloch's large work, "Die Prostitution," 1912.